JOURNAL OF GAS LIGHTING, WATER SUPPLY, &c.

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EDITORIAL NOTES—GAS, &c.

The New Session—Petitions against Bills.

UNDER clouds, political and atmospheric, the second session of the present Parliament was opened last Tuesday. The King's Speech does not foreshadow a programme of public legislation of any importance to industry. Labour monopolized so much consideration in the first session, that it is insinuated by the polite method of silence that little of the time of Parliament will be occupied by labour questions this year, if the Government are masters of the situation. This, of course, has not given pleasure to the Labour and Socialistic party in the House; and already there are protests against this and that—Old Age Pensions, for example—being ignored in the speech from the Throne as subjects that should be brought under immediate discussion. But if there is one thing that it is safe to say about the present session, it is that the Labour and Socialistic party will not fail to obtrude themselves and their desires both in and out of season. Already there are complaints from trades unions that their representatives have shown a wonderful and unacceptable aptitude for shaping their own policy; and it is thought that those who "pay the piper" should be privileged "to call the tune." Personal comfort will not be served by the labour representatives in Parliament quarrelling with those who recompense them; for any serious breach would mean for the recalcitrants a rapid descent from the benches of St. Stephen's to the workshop bench or to the re-handling of pick and shovel. Therefore, as we say, they are bound to make themselves seen and heard; and there are portents that because there are not sops for Cerberus, he will make himself disagreeable with the Government, instead of being content for a time with the large concessions that were obtained on first asking.

But to go to the other end of the Legislature. Between the House of Lords and the Commons what are described in the King's Speech as "unfortunate differences" have arisen; and Ministers have the matter under consideration with a view to some solution of the difficulty. The "difficulty" is the exercise by the Lords of their right of acceptance, revision, or rejection of measures sent up from the Commons. The right is possessed equally by the Commons in respect of measures sent down to them from the Lords. But the Commons are not agreeable to the Lords overhauling their work. There has been some fatuous talk about the abolition of the Upper House by those whose shout is stronger than their knowledge. The House of Lords being an integral part of the Constitution cannot be squeezed out of it on the peremptory demand of those to whom offence has been given. It is therefore merely the question of the "relations" of the two Houses that the Government can raise; and it is to the mending, after their own fashion, of those relations that the Government are about to devote themselves. In connection with gas legislation, the advantage of the Upper Chamber has been frequently felt, and at times also the disadvantage. But, on the whole, advantage has outweighed disadvantage; and with the accelerated mobility of Socialism, the need for the House will be all the greater in the future.

Among the foreshadowings of public measures, it is noticed that the regulation of the hours of labour in mines is to be considered; and the question of the amendment of the patent laws—principally to compel the working in England of foreign patents registered in this country—is to be introduced by the President of the Board of Trade. The "improving" of the law relating to the valuation of property will also have place among the polemics of the session. Bills of private members have come up with appalling force; but those that have gained the first dozen places, and are the only ones likely to be dignified by consideration this session, comprehend Bills relating to railway and canal rates and conditions of conveyance, the compulsory use of the metric system of weights and measures, the eight-hour miners' day, and the London Ports and Docks Bill. Against the last-named measure, there has been heavy petitioning; the London and other Gas Companies having works on the Thames being among those whose interests will be affected, and who intend to do their best in defending them.

The last day for lodging petitions against privately deposited measures having expired on the 12th inst., we are able to give elsewhere in this issue a list of petitioners against Gas Bills, supplemented by the names of Bills against which gas undertakings are compelled to protest, in order to obtain protecting clauses, or to assist in efforts to secure rejection. Wisdom has prevailed among those local authorities who have had introduced to their notice the second Joint Bill, promoted under the wing of the Gas Companies' Protection Association, for the removal of clauses relating to sulphur compounds in gas. There has not been a single petition lodged; so that the measure will proceed unopposed through the first House. Several of the local authorities have, and very properly (they being laymen in these matters), sought expert advice; and, in those instances that have come to our notice, the sound counsel has been given that—the question having been thoroughly thrashed out by competent men and before Parliament—it would be the height of absurdity to continue to attack a question settled beyond further dispute. Of the fifteen other Gas Companies' Bills introduced, a dozen of them have had petitions presented in opposition; but this is no indication as to the amount of contest that will ensue. In several cases, the petition is a mere precautionary measure, so that the authority may not be "out of court" in the event of negotiations failing; and the next few weeks will, if the history of recent sessions repeats itself, see much of the difference composed. The London County Council are not, through lack of opportunity more than of inclination, very busy among the Gas Bills this session; there being only one—the Mitcham and Wimbledon—in which they have managed to find something against which they desire, and apparently have, the privilege of protesting. The Llandrindod Wells Gas Bill will be an interesting measure, in that it reverses the usual conditions. Hitherto, it has been the experience of gas undertakings to have electric lighting undertakings invading their territory. Here the tables are to be turned; and, if Parliament endorses the Bill, a gas undertaking is going to invade the territory of an electricity undertaking. Llandrindod Wells has never enjoyed the conveniences of a gas supply; and, in fact, many of the inhabitants are not fully aware of the achievements in improved utilization of gas. It is consequently believed by the promoters of the gas undertaking that there is a good field in the town for profitable enterprise. The Local Authority have obtained clauses in their favour which they have honourably agreed removes all ground for opposition to the new scheme. The only petitioners against the measure are the electricity suppliers; and it is an indication of their feelings in regard to the threatened competition of gas that they have offered the Council their concern at cost price, *plus* 6 per cent. The judicious decision of the Council is that it is better they should not take any steps in the matter—at present. The East Hull Gas Company are, naturally, petitioners against the compulsory purchase Bill of the Corporation.

A sign of the necessity for presenting a compact front to the growing socialistic tendency of the times is furnished by the position of things electrical in London. The electricity scheme of the London County Council is, as we have shown, one having for its ultimate object the concentration of practically the entire electricity supply of London in their hands—an attack on existing interests encouraged to the utmost by the present Government. Through it, the Electricity Companies have at length been forced to propose

to amalgamate their systems as one way of resisting this deliberate assault on their pioneer enterprise. Defence has been for them a costly matter in recent sessions; and before the end much more money will have to be spent. What the Companies are prepared to show Parliament is (according to Colonel Eustace J. A. Balfour) that, if the power is given them to combine, they will be able to supply electricity in London at as cheap a rate as that offered by the County Council without any risking of public funds. And this is to be the result of the combination and better organization of existing resources. The Gas Companies are going to take a hand in the opposition to the County Council and certain other electricity schemes. It is perfectly obvious that London electricity supply will be the central feature of Private Bill work this session; but upon it the issue of the County Council elections next month will make a big impression, no matter what that issue may be. Of more immediate concern will be one or two fairly tough struggles in connection with Gas Bills. Beyond them, we are not anticipating there will be much argumentative work to be done, other than in private negotiation.

South Metropolitan Meeting—Coal Contract Prices.

From the plethora of topic before him when addressing the proprietors of the South Metropolitan Gas Company last Wednesday, Sir George Livesey had no difficulty in making an excellent selection; and the treatment of the subject-matter did not grant place to a dull moment throughout the speech. It was a speech that, from beginning to end, indicated a distinct disbelief in the tenets of the passive resister. Defence and active resistance animated almost every sentence. Right at the outset Sir George douched the operators in the Stock Market with some penetrating facts, which show how superficial was their observation when they thought fit to write-down, by a point, the price of the Company's stock, on the ground that the Directors' report for the past half year was "unsatisfactory." It was not the writing-down of the stock by a point, but the cause, that gave offence. A fortnight ago, in dealing with the Company's report and accounts in the editorial columns, clear indication was made that, the circumstances of the half year considered, the results were not such as need create any dissatisfaction. There have been slight depressions in the financial level of working since the price of gas has been at 2s. per 1000 cubic feet; but those depressions have been comparatively slight, and are entirely traceable to causes that could not possibly have been foreseen or controlled by any group of administrators, however gifted or capable—causes such as the capriciousness of markets and abnormal meteorological conditions. When there is talk of the half year's report being "unsatisfactory," it indicates that intelligence is unequal to going, or indisposed to go, lower than the surface of things. In this case, if there had been penetration instead of contentedness with the superficial aspect, dormant resources would have been discovered, which are immediately available if those that are current should show any disquieting deficiency.

There is one dormant resource in the South Metropolitan Gas Company that the Chairman and his colleagues are loath to disturb if they can possibly avoid it, and that is the price of gas. It has been proclaimed from the chairs of the three London Gas Companies—and with no uncertain note from that of the South Metropolitan, notwithstanding external gratuitous counsel—that the price of gas will only be raised if the circumstances which have not yet been fully sounded, make such a course imperative. No one, with nebulous conditions present, would be so foolish as to say that an increase in price will not be requisite; but it is hoped there will be a means of escape from recourse to such action. Anyway, it will only be a "serious" advance in the price of coal that will move the Directors of the South Metropolitan Gas Company. A 1d. increase in the price of the gas would immediately add income at the rate of £52,000 a year. No question of diminishing the Company's existing dividend by the operation of the sliding-scale comes into consideration in the determination of the Board not at present to supplement revenue by that amount, seeing that the 5½ per cent. dividend is now below the statutory point with gas at 2s. The Company could, in fact, raise the price by 2d., and bolster their income up with £104,000, without doing any more injury to the proprietors than reducing existing dividends under the sliding-scale by 8d. per cent. That is the most important of the dormant resources. If, however, it is not the comparatively small financial deficiency in the earnings necessary to pay the now customary, though not quite statutory, dividend, that caused the market to regard the report as "unsatisfactory," then it must have been the slight recession of the consumption of gas in this half year of abnormal heat and light, aided by the economy of the incandescent burner, which does not encourage waste in any way; for waste with it fortunately means loss of illuminating power. The change that set in towards the close of the half year, when the thermometer fell rapidly, caused a spurt in consumption; but, owing to the early reading of the meter indices in a large part of the district, neither that nor the Christmas consumption lent any material assistance to the half year. Its influence, however, will be felt in the current six months. It seems a little unfair to the December half of the year that, commencing in the summer, it should not get the credit of a larger proportion of the heaviest days' consumption; for as things are, the June half year gets the largest pull from the season of fattest consumption. On a yearly comparison, the inequalities are ironed out.

Candid, pointed, and spirited were the remarks that Sir George made on the increase in the quoted prices of gas coal. This question of coal prices with the approach of the contract season is for the gas industry no mere sentimental one; it is a question of business, and must (though the coal owners would have it otherwise) be dealt with in a business-like way. The coal owners, through their representatives, are accusing Sir George of crying out before he is hurt; but a little reflection will show that this is one of those matters in which there is precious little good in crying out after the hurt has been inflicted. When the threat is uttered, then is the time for protest; for the absence of protest may be taken to imply that the execution of the threat will be taken quite good-humouredly. Because the gas industry is not submitting tamely to their inflated demands, the coal owners are feeling aggrieved. They plead that the present is a well deserved boom, which will enable them to make up past losses; and they deny the existence of any combinations or understandings among themselves. They suggest that the gas industry should dream while they are active; and they decline to recognize that there is an obligation on the part of Directors and Committees to do everything possible to purchase cheaply, even to meeting united action by the like. Their one-sided views do not command approbation. The gas industry quite admit that the time is one when a higher price should be paid for coal; but the rapacity that has come with opportunity is the ground of complaint. It is idle for the coal owners to try to justify the prices they are quoting for future contracts, by talking so loudly about past losses. The prices of gas coal continued too long in the nineties with only variations within a shilling for credence being now given to the attempted vindication of the owners' flights in the present by holding up their business in those years cloaked in a kind of commercial philanthropy, with trimmings of self-denial. There is no disputing the fact that coal owners' expenses have increased; but between the prices of a few years ago—with now a fair additional profit in view of the increased prosperity in the iron and steel and textile industries, including, too, the extra working costs—and the prices upon which the owners have set their minds there is a margin for the existence of which there is no justification.

As to the assertions that it is a mistake to suppose there are combinations among the coal owners to maintain prices, they can upon the evidence only be treated with suspicion—we might almost say with contempt. The assertions emanate from owners' Associations; and the "Iron and Coal Trades "Review," the official organ of the National Association of Colliery Managers, says: "At the present time, gas under-"takings are face to face with a large rise in the price of gas "coals; and what is equally important the coal owners are, "by reason of local associations of collieries, producing gas "coals under excellent circumstances for taking advantage "of the situation." In face of this, how can the gas industry regard as reputable the denial of combination? The owners will hardly thank the official organ of the Managers' Association for its frankness. At both the South Metropolitan and Commercial Gas Companies' meetings, the effect that the removal of the coal tax is having on the industry of this country was emphasized; and the present exaggerated views of the coal owners as to home prices will do more than anything else to spread, and give prominence to, the question as to whether the abrogation of that tax was wise in the interests of the country. It is for the coal owners

to look at this matter broadly, and ask themselves whether their present abuse of opportunity will not be more detrimental to them in the long-run than moderation. There is one crumb of satisfaction. The current half year is not the one, owing to current contracts, that, with most gas undertakings, will feel to the full the effect of the high-priced coal; but it will not be forgotten that the fresh increases in quotation are additions to the increase of last year. In Sir George Livesey's speech, there are many points bearing upon this subject that are worthy of more than passing consideration.

Commercial Gas Company.

As we anticipated, the Chairman of the Commercial Gas Company (Mr. W. G. Bradshaw) had, at the meeting on Thursday last, little more to tell the proprietors than the accounts revealed. Buoyant spirit and sanguine temperament, combined with prudent care, are useful aids when difficulties impend; and no proprietor could have left the meeting without being impressed that these important factors in successful business administration are concentrated, in no mean degree, in their Chairman. He gave due weight to the anxieties and difficulties that the Board had in front of them, especially in connection with coal; but he declared that those "anxieties and difficulties were not insuperable if "they brought care and determination to bear upon them—"certainly, they were not intolerable when they had the "support and sympathy of the proprietors." He places great reliance, too, on the loyalty of the workmen in helping the officers and the Board to pull through the difficulty, by producing better work and realizing increased economy. The Company—through the reconstructions of recent years—have their works and means of material conveyance to and from the works in excellent order to assist in producing the maximum economy. No considerable capital expenditure is in view other than for the requirements of the business in the district; and there is no abatement in this, nor is any required, for the capital so expended becomes, through additional consumption, immediately remunerative. Notwithstanding the pressing claims that the Company have had upon them for capital in this direction, and notwithstanding too that under their old Act (which gave the proprietors the advantage of new issues at par) they were working with extraordinarily dear capital, it is interesting to note the moderate condition of the capital expended per million cubic feet. The capital on works and mains stood at the close of last year at £374 per million cubic feet; and, including prepayment meters, services, steamships, &c., the total capital only averaged £442 per million. For this state of things the Chairman gave honour where honour is due. Mr. Bradshaw also addressed himself to the prospective increase in the price of coal. When he says that "asking does not "always mean getting," there is the indication that the Board have made up their minds not to take the demands of the coal owners lying down. At any rate, two-thirds of the coal that will be used by the Company in the present half year will be at the old prices; so that, it may be anticipated, dearer coal will not have such a material influence this half year that the next accounts will be greatly affected. Mr. Bradshaw has announced the intention of the Directors to strain every nerve to avoid the necessity of raising the price of gas; and, knowing the views of certain members of the Board as to low prices to consumers, that intention is precisely what would be expected of them.

Electricians and Gas Fatalities and Explosions.

The Electrical Press, or a section of it, are just now taking either a morbid interest in gas fatalities, or their extremity is so pressing for argument to turn householders from their preference for gas to electricity that they have to rake among the effects of negligence and suicide to help them. We should not raise any serious objection to this, if, in using the results of these lamentable occurrences, our contemporaries would fairly and honourably explain the means by which the gas escaped that brought about the fatality, so as to show householders that folly and not gas was the primary cause. Negligence and premeditated self-destruction are responsible for the greater number of these happenings that are reported by the Daily and Electrical Press as "gas fatalities." Neglect of the old-time chandelier is a somewhat fruitful cause of escaping gas; and gas suppliers are constantly urging their abolition by consumers, as we have also done on several recent occasions—the last time in an editorial being in the "Journal" for Aug. 14. Water-slide chandeliers have altogether lost their market; and they are not suitable to present-day lighting. Those that are in existence are relics of the past; and in modern equipped houses they are not to be found. Their fewness causes people, where they are retained, to forget the necessity for replenishing periodically the water-seal, and the negligence in performing the simple duty has a bad way of extending itself. It is therefore better, as gas suppliers are constantly suggesting, that those remaining should be "scrapped." Moreover, the water-slide chandelier is, unless coverted into a fixture, totally unsuited for modern gas-lighting equipment. In the olden days of flat-flame burners and globes, the water-slide chandelier had less weight to carry than it has when fitted in modern style. We have seen a lightly built chandelier fitted with adapters and three inverted burners and globes. The weight this chandelier had to carry was considerably increased, with the result that the line of water-seal was also considerably reduced, and more frequent watering was consequently required. Much the same with vertical incandescent burners, with chimneys and heavy globes. One chandelier so fitted (with counterbalance weights unequal to the increased pull) that has come under observation, had the chains wired to the pulley-wheels to prevent descent. These illustrations by the way, merely to show the unsuitability of water-slide chandeliers for modern fittings.

It is, however, the personal part that householders, by negligence, take in producing disaster that the electricians, when referring to fatalities and explosions, glide over in a manner that can only be described as dishonourable, with a view to defaming their strong competitor. On the points of cost and illuminating power, they have utterly failed in impressing the average householder. The facts have been too stubborn. The householder, too, whose father, grandfather, and perhaps great-grandfather lived in rooms lighted by gas, listens with amusement, and treats with contempt, the tales about the poisoning of the atmosphere—particularly now that the incandescent burner has so considerably curtailed the amount of gas used in rooms. Under these circumstances, the electricians are trying to coerce the gas consumer into a change of patronage by endeavouring to excite terror, with illustration of the effects of negligence or carelessness, and by laying the blame upon gas when it is entirely a personal matter. If people will have loose gas taps, neglect to replenish the water in old-fashioned chandeliers, will retire to rest with pipes that they have plugged with cork and soap instead of having them properly capped by a competent fitter, or if they will make, or allow to be made, connections between two pipes (as in the Whitechapel case) by a piece of india-rubber tubing, the fault lies not with gas but with themselves. Just as fairly could it be said that cycling should be condemned because foolish riders chose to go down hills on machines with unworkable brakes, loose nuts, or cracked frames or rims, or that razors should be vilified because some folks chose to employ them instead of some other method open to them for terminating their earthly career. The "Electrical Times" and the "Electrical Bulletins" have been quoting cases of gas fatalities without in all cases explaining how they have been caused; and they give a little list of fatalities which shows by comparison with the 5½ millions of gas consumers in this country, without counting families and employees, what a safe thing gas really is, and how free from fatality the gas industry would be if it were not for consumers' personal negligence, intentional act, or the disturbance of gas distribution systems and the soil about gas-pipes by the unavoidable (though not always carefully conducted) road work of local authorities and companies in connection with other services—electricity, for example.

The adjectives that are used by those of our electrical contemporaries who deal with this subject are chosen with discrimination, with the view of striking terror deeply into the minds of gas consumers; but in certain cases the object is spoilt by intermingling a flippant style, which indicates a shallow earnestness. Flippancy has neither weight nor durability, but the dismembering of the statements of opponents for the purpose of making a point, may have weight and durability through the disguising, thus meanly produced, of the intention of the original words. The "Electrical Times" says: "It is admitted by the 'Journal of Gas Lighting' "that in many gas-works in the country electric lighting is "the vogue on the score of safety." Was it fair of our contemporary to leave out the appended words—viz., "in those

"buildings where, accidentally, explosive mixtures may be "formed?" We do not feel in the slightest degree injured; but it is apparent there is room for a little more honour even in journalism. In the very same issue in which the "Electrical Times" belittles itself by this abbreviation of a quotation to obtain misrepresentation, there also appear certain illustrations of some wrecked rooms said to have been due to a coal gas explosion. The rooms are lighted by electricity; and our contemporary remarks that this is a case where gas escaped from the fittings probably as the result of a faulty connection in the neighbourhood of a ceiling rosette. If this is so, it might be well to inquire who disconnected the old gas-fittings, and capped the pipes in the rooms where electricity is used; for gas-pipes being in existence it may be presumed gas was previously employed. It may be found that it was through this disconnection and imperfect workmanship, that the escape was caused; or perhaps it is an instance of the fusion of a gas-pipe through the companionship of a defective electric wire. Perhaps the electrical fitters can throw some light on the point. No information in this regard is given in our contemporary; and so we make the suggestions as ones that it may be found worth while looking into. We are also reproached with giving the minimum of space to the reporting of gas explosions and fatalities. Unfortunately for the "Electrical Times," the illustration of our shortcoming in this respect to which they gave the prominence of reproduction, was the subject of a further paragraph in the succeeding week's issue of the "JOURNAL." This was not acknowledged by our contemporary. Looking back, we do not remember that the electricity papers devote to fires, fatalities, and other accidents in which electricity is concerned, quite so much space as we do to similar occurrences in connection with gas.

However, as electricians are persuaded that it is hard to gain business by merit, and so have in their desperation to seek the aid of fatalities brought about in most cases by allowing gas to leak, carelessly or intentionally, we merely ask them to make use of that aid in an honest manner.

National Physical Laboratory.

ATTENTION was directed in the "JOURNAL" in November, 1905 [Vol. XCII., p. 528], to the fact that the National Physical Laboratory had not up to that time applied to good purpose the State grant and other funds placed at its service. It was pointed out that very little physical research work had been accomplished, and that there were grave reasons for suspecting that the objects for which the Institution was founded were being neglected in favour of commercial projects for which it was not adapted, and with which it had no proper concern. Our attitude towards this comparatively young national institution may at the time have seemed somewhat ungenerous; but it has been fully justified by the course of subsequent events. Before the ensuing summer questions had been asked in Parliament with reference to the work undertaken and accomplished at the Laboratory; and an admission had been reluctantly drawn from the Government that much of the work lay outside the sphere of activity defined for the Institution at its inception. The misuse which the Laboratory had been making of its position and support as a State institution was so clearly displayed that the demand for inquiry into its operations could not be indefinitely disregarded; and we recorded last week the appointment by the Treasury of a Committee "to inquire generally into the work now per-"formed at the National Physical Laboratory, with special "reference to the character of the tests undertaken there "and the lines on which any further development of the "work of the laboratory should proceed."

"The Times," in its Engineering Supplement, and several of our technical contemporaries have already complained of the composition of this Committee on the ground that the Chairman, the Right Hon. G. W. Balfour, is a near relative of the Chairman of the Executive Committee of the laboratory, and that two other members—viz., Sir Andrew Noble and Sir J. Wolfe-Barry—are members of the Executive Committee, and are declared advocates of the laboratory's policy of commercial aggrandisement which has hitherto given such offence. No impartial judgment of the things done and the equally important things left undone by the laboratory in the past can be expected of a Committee of which a majority is virtually pledged at the outset to a particular view. It would be nothing short of a national scandal if the inquiry into the work of the laboratory were left in the hands of a biassed Committee; and some change in the composition is therefore peremptorily called for. The addition to the Treasury Committee of a number of technical men who are entirely independent of the Executive of the laboratory is suggested by "The Times," and might suffice. But it would be far better for the Treasury to entirely re-constitute the Committee of Inquiry.

It should not be forgotten that serious as is the charge that the laboratory is illegitimately interfering with the private work of engineers and others who undertake, satisfactorily, trials of plant and processes, and routine mechanical testings, the still more serious accusation is made against it that its legitimate work of research and standardization is being neglected and badly performed. That this accusation is not without good foundation must be obvious to gas engineers who have followed our reports on the photometrical investigations which the laboratory appears to have undertaken light-heartedly and to have carried out under improper conditions in the intervals between ineffectual attempts at the verification of secondary standards of light. As a fact, important investigations—such as that recently reported by Mr. Paterson, on the behaviour of standards of light—should never be pursued without outside direction from an Advisory Committee of experts in the particular branch of technics concerned. Otherwise, the investigations will most commonly prove futile owing to the well-meant but misdirected efforts of the laboratory staff. If, for instance, photometrical investigations are to be further pursued at the laboratory, let a few competent experts be asked to advise as to the scheme of research and methods of work to be followed. We do not doubt that the advice of a Committee comprising (say) representatives of the Institution of Gas Engineers, and of the Institution of Electrical Engineers, with one or more of the Gas Referees, and a few independent experts—like Lord Kelvin, Professor Harold B. Dixon and Professor W. E. Ayrton—would have saved Mr. Paterson from the many serious pitfalls into which he fell in the course of his recent investigations on standards of light.

The Gas Section of the Irish International Exhibition.

The time is now fast approaching when the preliminaries connected with the Irish Exhibition will have to be completed. There are, in fact, from the date of this issue of the "JOURNAL," only ten more days before the list of applications must irrevocably be closed for the Gas Section; the exhibition authorities having definitely decided that March 1 is the outside limit of time they can afford. Owing to the want of space the exhibition authorities have been obliged to curtail somewhat the dimensions of the space originally allocated to the Gas Section; and the unoccupied space has now, in consequence, narrowed down considerably. It is therefore hoped that any manufacturing firms who are still wavering in decision will promptly—the earlier the better before March 1—come to a determination, as that will be of great personal assistance to Mr. Francis T. Cotton and to the Exhibition authorities. Those firms who have engaged spaces have, there is no doubt, made up their minds to interest the large public attendance expected, from near and far, during the run of the exhibition; and the members of the Institution of Gas Engineers will, there is certainty, during their annual meeting in Dublin, be equally pleased and interested in making their inspection.

The Flame Standard Tests at Bushey.

Our contemporary the "Electrician" grudgingly admits now that the consideration shown by Mr. C. C. Paterson in referring, in his recent paper, to the courtesy of the Institution of Gas Engineers in permitting him to publish the results of the tests on flame standards which had been made at their request and expense, was in some measure due. The partial concession on the part of our contemporary shows how ungracious and unfounded were their original remarks—viz., "We think it might be held that the permission to publish such results is altogether unnecessary, as they have been obtained by the application of public funds." The matter is not worth bickering over; but it may be pointed out that our contemporary now shifts its ground, in endeavouring to minimize its ignorance of the payment by the Institution of the funds directly spent over the investigation. It is now said

that "the National Physical Laboratory being an Institution which is dependent upon public funds, the results of investigations there carried out should be public property." Just so. But we are afraid our contemporary fails somewhat to see the point of Mr. Paterson's acknowledgment, and of our little protest against their slur upon that acknowledgment. Does it not follow that the tests having been made for the Institution of Gas Engineers and the expenses incurred paid by them, they had certain claims, and their organization was clearly the channel through which publication would, in ordinary circumstances, have been first made. Mr. Paterson in his paper explained that the Institution of Gas Engineers had only refrained from publishing the results earlier at the request of the International Photometric Committee; so that, on the first available opportunity, they would have been published through presentation at a meeting of the Institution. Mr. Paterson desired to use the results before the Institution of Electrical Engineers; and notwithstanding that their own members have not yet received them, the Council of the Institution of Gas Engineers did not demur to, or hesitate in permitting, first use being made of them before the Institution of Electrical Engineers. That is why we consider the remarks of our contemporary were ungracious and totally uncalled-for.

Gas Companies and Capitalization.

In the "JOURNAL" for Jan. 15 (p. 171), there appeared some extracts from an article in the "Joint-Stock Companies' Journal" which showed, by actual example, the great influence that past policy in dealing with the capital expenditure of gas undertakings has upon their present prosperity. The degree of prosperity has, of course, a very close relationship with the capital account; and the price of gas to the consumers relies very largely on the cost of the capital per 1000 cubic feet of gas sold. But with a low capital account, there is another effect, and that is, when reductions of price are made, how largely it widens, under the sliding-scale, the difference between the distribution among the proprietors of the undertakings concerned and the total of the saving to the consumers effected by the reduction. This point was made by Mr. H. E. Jones at the meeting of the Wandsworth and Putney Gas Company last week. In the table published on the 15th ult., it was seen that the charge for capital per 1000 cubic feet in the case of the Wandsworth Company is 6·69d. per 1000 cubic feet; and the ordinary price of gas is 2s. But allowing for discounts, the prices work out to an average of 1s. 10½d. The last reduction that was made to the consumers benefited them to the extent of £3616 in the half year; while, owing to the low capital account, the proprietors have distributed among them only an additional £422 for the half year. That is to say, the reduction in price and the extra amount required for dividend together represent a sum of (using round figures) £4000 in the six months. Of this, the consumers take no less than nine parts out of ten. The one-tenth part that the proprietors receive is not a great reward for the benefits conferred upon the consumers; but the former have the satisfaction of knowing that the position they occupy is one of great stability.

A Suggested Audit Commission.

One of the members of the Liverpool City Council is of opinion that the present audit system is a thoroughly unsatisfactory one—instancing as an example of this the fact that since 1893 some £4000 has been spent on putting up lamps in unadopted streets, an outlay which he contends would not have occurred if there had been a properly constituted audit. To remedy this state of affairs, he proposed at the last meeting of the Council that the present Elective and Lord Mayor's Auditors should be abolished, and in their place there should be "a board of twelve accountants elected by the ratepayers, who would give their services free, and have under them a staff of clerks, and have entire control of the Audit Department." These Commissioners, he argued, would be an intensely critical body, and would, by publishing frequent reports, throw a blaze of light on the doings of every Committee. He confessed that he did not suppose Parliament would give Liverpool a Private Act; but he believed that an expression of opinion by such a body as the City Council would stir up the Government, and induce them to deal with the matter. In the course of the discussion, it transpired that, as long ago as 1896, both the Auditors and the Town Clerk expressed the view that the cost of placing lamps in unadopted streets should be borne by the owners. The Lighting Committee agreed in the first place to the adoption of this course; but at their next meeting the resolution was rescinded, and the Council confirmed the rescission. This, of course, clears away that particular example of the inefficiency of the present system of audit; but several members still persisted in the opinion that a much better arrangement could be made than that now existing. The Corporation, it may be remarked, have already a Control Department, which checks expenditure before money is paid, in addition to the Auditors' Department, which checks accounts after they have been paid; and both these departments are now absolutely distinct and separate. This system, it is stated, has been copied, and is going to be copied, by many other towns. It was pointed out, however, that it is merely an internal audit; and that "a board of directors might as well audit their own accounts, and give themselves a certificate." In the end, the suggestion in favour of an Audit Commission was withdrawn, on behalf of an amendment that the Council should petition Parliament to give effect by early legislation to the recommendations of the Joint Committee on Municipal Trading in favour of the appointment of professional accountants subject to the approval of the Local Government Board.

Municipal Trading Failures in America.

In view of the elections for the London County Council on the 2nd prox., a good deal is being said by the Progressive candidates and their supporters in favour of municipal trading. It may therefore be not out of place to call attention to a few failures which have occurred on the other side of the Atlantic, as recorded by a Nebraska newspaper in the course of a discussion on the refusal of the American League of Municipalities, at their recent meeting in Chicago, to endorse the principle of municipal ownership. According to the paper referred to, the towns and cities in the West were the first to undertake on a large scale the ownership of gas and water works, electric lighting, street cars, railroads, &c.; and it is a noteworthy fact that they have been the first to give them up, and return to competition, where the business man and the skilled engineer can have charge of the public utility systems, to the exclusion of the politician. Among the dozen failures reported from Southern Indiana, that at Muncie is one of the most notable. In that city, the Municipality, who had for years owned the electric lighting plant, abandoned it last summer, and went back to a private contract. May it not be supposed that Woolwich, with its £42,000 of deficiency on the electric lighting account, would be glad to do likewise? Indeed, there are already signs of such a desire on their part, as they are reported to be closing the wiring department shortly. In Denver, the greatest election fight ever known in the State went against municipal ownership, for the simple reason that under this system there had been fastened upon the city "a most pernicious political ring of grafters and saloon politicians, who were kept in power from year to year by their control of the utility company." In order to continue in this control, the "rings" appointed their own henchmen to vacant positions, leaving out altogether the deserving workmen and competent craftsmen. "You vote for the machine or you lose your job," was the motto. Another reason for the rejection of the principle of municipal ownership—and it is one which is having weight on this side—was that it was simply a form of Socialism, and was being used by the Socialists as the medium for securing the adoption of other items of their programme. Public opinion on the Socialists' propaganda has lately been expressed in no uncertain manner in Germany. We shall have an opportunity in a few days of seeing what London thinks of it; and we shall be surprised if the result is not much the same.

The Tar (Patents) Solidifying Company, Limited.—A Company has been formed under this title, with a capital of £10,000, for the purpose of working the patents of Mr. S. G. Coulson, for the treatment of coal tar, with the object of rendering it sufficiently solid for safe transport in easily handled cases or packages, and so making it more portable and convenient for many purposes. The prospectus of the Company is advertised in this issue; but as our attention was only called to it and the process as we were going to press with this issue, we must delay for a week further reference, excepting to say that abstracts of the patent specifications were published in the "JOURNAL" for July 26, 1904, and July 3, 1906.

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 489.)

BUSINESS on the Stock Exchange all last week continued light and quiet. It was account week, and was not wholly free from some anxiety. But the settlement proved to be a not very heavy affair, and on the whole was got through satisfactorily, though in the cases of two small operators the difficulties proved unsurmountable. Markets were a prey to a good deal of sensitiveness, and change succeeded change with about equal impetus; so that the net result was not far from a balance. A favourable influence was the better feeling in the American Market, which was much wanted; but a disagreeable feature was the depression in Home Rails, owing to the pertinacious attacks of those who would impose on the lines the obligation to run a multitude of workmen's trains at a loss. In the Money Market, after a short period of ease, a strong demand set in, which had the effect of stiffening rates up for short loans. Discount rates were similarly affected, and there was not much slackening off to be detected before the close of the week. Transactions in the Gas Market were at first quite devoid of animation; and the first half of the week was quieter than the average for some time past. But it quickened up a bit later on, although still remaining below a fair medium. There was no dominant tendency either way; but balancing losses against gains in quotations, the upward movements had rather the best of the game. Of course, the great coal question is an omnipresent reality; but there is every assurance that the responsible managers of gas companies will handle it with judicious calm. In Gaslight and Coke issues, the ordinary was very quiet, but a little disposed to advance. The opening prices *cum div.* were from 96¼ to 98¼, and afterwards *ex div.* from 95⅝ to 96½. The secured issues were far more active. Early prices *cum div.* were for the maximum 90 and 91; for the preference, 108¼ and 109; and for the debenture, 85 and 86. Later *ex div.* prices were for the maximum from 88 to 89⅛; and for the preference, from 106 to 107. South Metropolitan had a brisk opening; but transactions fell away as the days went on. Prices ranged from 128½ to 127 special *cum div.*, with one bargain *ex div.* at 124½. The debenture changed hands at 85 and 86. Commercials were not touched. In the Suburban and Provincial group, Brentford old was done at 263 and 265, ditto preference at 124½, British at 42½, Hastings 3½ per cent. at 100⅜ and 100⅝, and West Ham at 104⅝ and 105. The Continental Companies were little dealt in. Imperial changed hands at from 181 to 183, Union at 125 (a rise of a point), European fully-paid at 24⅞ and 24⅛ (a rise of ½), and ditto part-paid at 18¼. Tuscan debentures marked 102¾ and 103¾. Among the undertakings of the remoter world, Bombay new was done at 5⅛ and 5¼, Cape Town at 14½, Monte Video at 12, Primitiva at 8, ditto preference at 5⅛ and 5 7/32, ditto debenture at 95¼, River Plate at from 12¼ to 12½, ditto debenture at 96½, and San Paulo at 13½.

The closing prices are shown in our list on p. 489.

ELECTRIC LIGHTING MEMORANDA.

Further Laboratory Tests, with Regulated Voltage, on Nernst, Tantalum, and Carbon Filament Lamps—Cost of Flame Arcs—Recession from Normal Growth: Causes and Effects—Gas and Electricity in Railway Accidents.

THE Institution of Electrical Engineers have given to the world an ample supply of material to show that, even with regulated voltages, the actual performance of the lamps with which electricity consumers are supplied falls terribly short of reputed performance. There was Mr. Paterson's paper to which we have recently been devoting some attention; and now we have one by Messrs. Haworth, Matthewman, and Ogley, of the Liverpool University. Hitherto, tests on Nernst and ordinary incandescent lamps have been mainly confined to the observation of their working on continuous current circuits; but the study of the behaviour of such lamps with alternating currents has been somewhat neglected. It was with a view to determine whether the working of such lamps on an alternating current circuit was in any degree different from that when using continuous current, that these three investigators conducted their tests. The greatest difficulty in making life tests on lamps is to keep the applied voltage constant; since, if this is not done, the value of the tests (the authors of the paper hold) is comparatively slight, unless the actual pressure variations are recorded. This is the exact point on which we disagree as to the value to the consumer of these laboratory conducted tests; seeing that the maintenance of a constant voltage is a condition under which the consumer is not privileged to use his lamps, and restless voltages have an injurious effect upon the useful life of his lamps. For these tests at Liverpool an apparatus was specially designed and made for automatically keeping a constant voltage.

The first tabulated results are from Nernst lamps, and carbon filament lamps; and a comparison shows a saving of 57 per cent. in watts per candle in favour of the Nernst lamp. But the percentage cost saving is much less than the percentage energy saving, on account of the frequent and expensive renewal of glowers and iron resistances. Against the saving in running cost must be placed the much higher capital outlay on the lamp, the large sizes in which it is manufactured, the time it takes to light, and the erratic life of the glowers. In fairness, however, it must be remembered that these tests are made with alternating currents, while the Nernst lamp appears to work much better with continuous current. In every case during the tests of the Nernst lamp, there were breakages. Looking at the detailed results in the table, it is found that the average watts per candle for the lamps varied as much as from 1·70 to 2·38—the average candle power of the lamp taking the lowest amount of current per candle power being the best (65 candles), and that of the lamp taking the highest amount of current per candle power being the worst (43·18 candles).

In the first series of tests of carbon filament lamps, faith is somewhat shaken in the price of the lamps being any criterion of good or indifferent performance. For here we have a lamp costing 7½d. giving an efficiency of 3·72 watts per candle, while one costing 16d. took 9·20 watts per candle. These are the extremes, and must not, of course, be taken as applying generally. But it does so happen in this set of tests, that a cheap carbon filament lamp showed the highest efficiency and an expensive one the lowest. Between the two efficiencies named, the lamps gave most erratic results one with the other, and between reputed and actual performance. The test in the cases already referred to were carried to 300 hours. In other tests with results recorded for the first, second, third, and (where the lamps did not fail) fourth 250 hours' use, the same variability was observed, with a greatly increasing consumption with age. The authors, indeed, have good reason for saying that the accepted consumption of 4 watts per candle is "generally the exception" on alternating current lamps. Levelling down to an average "the average watts per candle" for the seventy carbon lamps tested, it was 4·86; for the eight ¼-ampere lamps tested, 4·14; and for the six Tantalum lamps, 1·97. The ordinary ¼-ampere Nernst lamp of commerce is thus about 15 per cent. better than the average carbon lamp; while its life is about 560 hours. But the breakage troubles cannot be neglected. The average consumption of the Tantalum lamps tested was 60 per cent. less than that of the carbon lamps; and their average life was only 330 hours. Of course, it will be remembered that the makers of the Tantalum lamps do not recommend them for use on alternating current systems. Considering the results generally, they call to mind what Professor Ayrton said in the discussion on Mr. Paterson's paper, that the cost of lamps is of minor importance compared with a consumer's expenditure for energy. Such divergent results as the paper shows are thought to emphasize the need for standardization; but it must be submitted that the advantage of lamp standardization loses much of its value to the consumers while voltages are so variable.

The Birmingham Section of the Institution of Electrical Engineers has been discussing the relative costs of running electric lamps; and one of the speakers (Mr. A. Lindsay Forster) gave some computations as to the cost of using flame arcs. They are worth reproducing—

Cost of Running for 1000 *Hours on* 220*-Volt Direct-Current Installation.*

FLAME ARC—9-ampere, 17-hour.

	£	s.	d.
2000 units, at 1½d.	12	10	0
Chemical carbons	4	10	0
260 trims (wages)	2	3	4
Repairs	2	8	0
Four lamps	21	11	4

Per lamp, £5 8s.

FLAME ARC—7-ampere, 40-hour (magazine).

	£	s.	d.
1650 units, at 1½d.	10	6	3
120 trims (wages)	1	0	0
Chemical carbons	1	10	0
Repairs	3	0	0
Four lamps	15	16	3

Per lamp, £3 19s.

It will be remarked, in the first place, that the charge for current is placed at the low figure of 1½d. per unit—a price at which, for lighting purposes, few electricity undertakings can afford to supply. The cost of the chemical carbons—remembering that the figures are only for 1000 hours—shows their expensiveness; and the item for repairs for 1000 hours' use is heavy. But they are not heavier than the real expenditure. It will also be remarked that such matters as charges for capital cost and renewal (we suppose they are considered too trivial to notice) are not deemed worthy of inclusion, though the figures quoted last week as to the cost of the installation in Oxford Street indicate that, in considering a system of flame arc lighting, these charges are not altogether negligible quantities. It will also be obvious from the number of trims the lamps require in 1000 hours that "wages" for lamp trimming in the electrical industry is a matter that ought to receive the consideration of the trades union—if the men have one. We have seen as many as three men wrestling with the trimming of a flame arc at Blackfriars Bridge approach. Regarding the respective charges per lamp of £5 8s. and £3 19s. (without capital and renewal charges), if the lamps are intended for public lighting, and if the old lighting tables of 3940 hours or 4300 hours per annum are adhered to, the 1000-hour charges per lamp have to be multiplied by four to get at the annual charge. But there appears to be a disposition for the old public lighting hours to shrink considerably in number for electric lighting, at the behest of electricians, in order to obtain economy. Even then public lighting accounts rise with extraordinary sprightliness.

It is observable that electricians are all too fond of accusing "the gas people" of exaggeration. They can give no one credit for honesty but themselves; and we are inclined to think that they do not all believe in their own honesty. We have here in

Mr. Lindsay Forster's remarks a point showing an exaggerated view as to the cost of high-pressure gas-lighting. This instructor of electricians in the matter of cost says: "High-pressure gas (say, 350-candle power gas), at 1s. 9d. per 1000 cubic feet, costs, including mantles, attendance, bye-pass, &c., per 1000 hours, £4 6s. 3d." Now a 350-candle power high-pressure lamp consumes 10 cubic feet an hour, or 10,000 cubic feet in 1000 hours. 10,000 cubic feet at 1s. 9d. per 1000 = 17s. 6d., so that Mr. Forster allows £3 8s. 9d. per 1000 hours for mantles, attendance, and bye-pass. Gas authorities would be pleased to do any amount of business on these lines, as for public lighting per annum they would be receiving about £17 5s. per 350-candle power lamp. When gas was 2s. 2d. for public purposes, the Gaslight and Coke Company were quoting £18 for about 4000 hours' lighting for 1000-candle power lamps, including maintenance and special gas compression, &c. A slight difference truly between actual payment and Mr. Forster's hypothetical figures!

It may be taken that the St. James' and Pall Mall Electric Light Company are representative of undertakings supplying in areas particularly rich for business in electricity for ordinary purposes; and, therefore, that at any rate some of the causes operating in their case to produce a diminished income apply, in a degree, to most other electricity undertakings. The effect in the case of this Company has been to reduce the dividend from 14½ per cent. in the eight years preceding 1905, to 12½ per cent. in 1905, and to 10 per cent. in 1906. The salient causes producing this effect have been (according to the Chairman of the Company) the large amount of rebuilding that has been proceeding in the district, the heavy charges that have been incurred for parliamentary law expenses, and the general fall in the prices obtained for electricity. It has not been observed by the occasional visitor to the district served by the Company that rebuilding has been proceeding to such an extent that it should have occasioned so dire an injury to the business as is pictured, or that it should not have been compensated by new business. The increase in the parliamentary expenses, can better be understood; and we know that the pressure of competition (nothwithstanding journalistic sneers) has tended to force down prices charged to consumers. The Company are not now enjoying the former "normal growth" of business; so that it may be assumed they are working in the neighbourhood of the "saturation point" of electricity for lighting purposes. But it is confessed it is the "normal growth" that is urgently needed to put the revenue account in a more favourable light; and it is evident that the Company are looking elsewhere than to lighting to try to recover the "normal growth." But it is interesting to see how recovery is being sought. While the general fall in price has had a remarkable effect upon the revenue—the average price is now 3·21d. per unit, as against 3·42d. per unit in 1905—the Company are trying to produce equilibrium with the old normal growth by selling electricity for power and heating purposes at a flat-rate of a penny per unit! At this price, the use of radiators is, the Chairman asserts, rapidly extending. Then as to motors, the Company are placing these in consumers' premises at a "reasonable rate" for rent and maintenance; and it is proposed to extend this system to arc lamps, ventilating-fans, &c. But what is the character of the field for motive power? The Chairman replies that the Company have not, so far as their district is concerned, found evidence to support the sanguine estimates of the possible demand for power in London on which the large schemes before Parliament are based. Anyway, with this pushing of business at the penny flat-rate for purposes other than lighting, we can see the average price of 3·21d. per unit further falling; and as the average drop of 0·21d. between 1905 and 1906 represents, on the whole output, no less than £7200, of which the increased output only recouped £4000, the shareholders may see some further peculiar effects from the adoption of the flat rate of 1d. for power and heating. The use of metallic filament lamps is also charged with responsibility for a reduction in output; but the temporary loss, it is hoped, will be counterbalanced by popularization. That is a question of time, as the experience of the gas industry with the incandescent mantle has proved. Meanwhile, it is another bar to restoration of that "normal growth" so anxiously desired, and so imperatively necessary for this as for other electricity suppliers.

A short time ago, one of our electrical contemporaries in a moment of wild imagination talked at random of the horrors that had accompanied the adoption of gas for train lighting—speaking of people having been roasted alive in the sight of rescuers, and piling up the agony in a most vivid fashion. We asked for chapter and verse for this terrible state of affairs; but it was not forthcoming. Railway accidents are common in America; and electricity appears to take an important part in them. Writing upon the latest disaster near New York, the correspondent of a morning contemporary says: "Two of the cars were overturned, and burst into flames, their woodwork catching fire from contact with the electric rail, and many of those who were not killed outright, were burned alive as they lay pinned beneath the wreckage." Perhaps our electrical contemporary, when writing a few months since, had not got hold of the correct story.

The London and Southern District Junior Gas Association will hold their next meeting, at the Cripplegate Institute, on Wednesday, the 27th inst., when the business to be transacted is to discuss a list of questions sent in.

COAL PRICES AND THEIR RISE.

[COMMUNICATED.]

ACCORDING to the "Iron and Steel Trades Journal" [*vide* "JOURNAL," Jan. 29], an important step is being taken by the owners of gas-coal pits in the Midlands, working in combination, to considerably raise the price of gas coal. It is further hoped that fully 2s. 6d. per ton advance will be secured when the contracts for delivery in 1907-8 come to be made. Whether the colliery owners will be able to secure this advance, is another matter; and it is quite on the cards that they will be defeated. That the fluctuation in the price of gas coal should be equally as great as that in the price of steam coal, is manifestly unfair; for the annual consumption of gas coal varies but slightly from year to year, while that of steam coal fluctuates to a considerable extent. Consequently, it is not surprising that the price of steam coal should rise in times of brisk trade; but that gas coal should rise in the same proportion is totally unreasonable. In fact, it is merely a movement in sympathy, just as, in Stock Exchange parlance, we are told that "the Home Railway Market moved up in sympathy." It is a common occurrence, when a favourable development takes place concerning one railway only, to see all the other stocks in the same group advancing in market value. This is chiefly the cause of the rise in the price of gas coal—indeed, there can be no other reason.

A very good practical illustration of how to deal with a monopoly of a raw material was given about a year ago by the South Metropolitan Gas Company. The result was so entirely successful, not only for that Company but for the whole gas industry, that it becomes an object-lesson, and one that might well be acted upon in dealing with this greater problem. Sir George Livesey, in his speech to the shareholders of the Company, related the reasons that had induced the Board to purchase a monazite sand property in Brazil, and explained that the material—thorium—from which mantles are made was entirely in the hands of a "convention" comprised of four chemical manufacturers. It was, he said, with the determination to remove them, and not only them but the whole gas industry, from this precarious position that they carried out the transaction. The price of thorium was immediately reduced (probably partly through this action) from 53s. to 27s.—a reduction so great that, at the reduced price, it does not pay the Company to work the property. The primary object for which the property was purchased has been fulfilled; and, besides, there is no reason to suppose that the price of thorium will always remain at a low figure. Cannot the results achieved in this case be likewise repeated in the case of the more important raw material, coal? Would it not be possible for a Syndicate to be formed, under the auspices of the principal gas undertakings, to buy up some of the gas-coal properties, with the object of ensuring a uniform price? The uniformity of coal prices is the great desideratum—without it, the price of gas must fluctuate. A repetition of 1900, when the price on the Tyne rose from 8s. to 16s. per ton, is greatly to be avoided.

In other respects the gas companies are particularly well situated at the present time to resist the colliery owners; for the new Metropolitan burner makes it possible to manufacture a much larger quantity of carburetted water gas—amounting to about 20 or 25 per cent.—without using any more oil than previously; and should the price of coal be unduly advanced, the quantity bought from the colliery owners will doubtless be considerably reduced and a larger proportion of water gas made to supply the balance. A great deal has been heard lately of blue water gas plants; and if they are only half as successful as they are said to be, they will doubtless be erected in many works during the next few years. The great advantage of these plants over the ordinary carburetted water gas plant is, of course, the vastly increased yield of gas per ton of coke.

The colliery owners would be well-advised to look into the details of recent developments in gas manufacture, as they will find that the strong tendency among all progressive and up-to-date engineers is to increase the capacity of water-gas plant at the expense of the coal-gas plant; and there is not the slightest doubt but that any undue rise in the price of coal will materially hasten this tendency. *A propos* of this, it is interesting to quote from Mr. Corbet Woodall's speech at the recent meeting of the Gaslight and Coke Company, in which he said: "In our own case, we have already replaced coal to a certain extent by oil for the manufacture of gas; and we can carry this replacement still further, *if necessary* [my italics]. While we dare not at present contemplate reducing the charge for gas, we are resolved that nothing short of absolute necessity will induce us to raise it."

To those who read between the lines in the above quotation, it will be quite clear that, in the event of the price of coal being forced up, a much larger proportion of water gas will be made; for it is well known that whenever high prices for coal and coke

	s. d.	s. d.	s. d.	
Price of coal (delivered) . .	11 6	14 0	16 0	Increased
,, coke	13 0	15 6	17 6	Cost.
	d.	d.	d.	d.
Net cost of coal per 1000 c. ft. of gas sold.	5·68	6·92	7·90	2·22
Cost of coke per 1000 c. ft. of water gas sold. . . .	3·15	3·75	4·24	1·09

prevail (and they always fluctuate together) it is more economical to make water gas. The table on p. 459 shows that, supposing coal and coke were to rise 4s. 6d. per ton in price, the increased cost of making water gas would be only half as much as the increased cost of making coal gas; the reason, of course, being that the cost of coal in making coal gas is a larger item by nearly 100 per cent. than the cost of coke in making water gas.

With regard to the coal contracts for the current year, a noteworthy piece of advice is given in the South Metropolitan Gas Company's report, which, if acted upon, could not but be attended with beneficial results: "The gas companies are probably the best customers of the collieries that supply this class of coal; and, instead of acting as isolated units, they should act unitedly and refuse to pay unreasonable prices." This suggestion emanates from the most experienced of sources; and in the event of it being adopted, each company would be in a vastly improved position to deal with the colliery owners.

A GAS CONTRACT BASED ON CALORIFIC VALUE.

The Colombo Gas and Water Company, Limited, as recently announced in the "Journal," have made a contract with the Municipality of Colombo which stands unique in the history of gas supply. Taking advantage of what is expected to be the permanent return to this country, after 14 years in the East, of Mr. S. N. Wellington, the Company's (late) General Manager, we have obtained from him some further particulars respecting the new contract, which cannot fail to be of interest in view of the minimum prescribed for the calorific value and the candle power of the gas to be supplied for public purposes. The former contract for gas prescribed an illuminating power of 15½ candles; while the new one defines a 10-candle gas; but the test to be applied is for thermal value. Professor Boys' calorimeter is the agreed instrument to be used in making the tests; this being, as readers are aware, the calorimeter ordained by the Gas Referees for use in the London gas-testing stations for information only, and not for penalty purposes. The Colombo gas that is supplied under the contract is to have a value of not less than 400 B.Th.U. The Company undertake to maintain a 60-candle power light by the incandescent burner in the ordinary street lamps; and they find that, even with an 8-candle power gas, they can, consuming 3¾ cubic feet an hour, obtain a light of 72-candle power, with a carefully adjusted No. 3 Kern burner. Therefore between 72 and 60 candles, there is an ample margin. Considering these figures, Mr. Wellington's deliberate opinion is that the general future standard of illuminating power will have to be as low as, if not lower than, 10 candles; and while that would enable the retention of the lighting business, it would also give additional strength in the competition for power and heating. The conditions in Colombo are very severe for maintaining, without any special provision, incandescent gas-burners in proper condition; but, with special provision, and under stress of conditions that do not prevail in this country, the Company's average consumption of mantles—bearing in mind the minimum of 60 candles per burner—is only nine per lamp per annum. The Municipality do not give the Company any latitude for lax dealing with the public lighting; for they have an inspector whose sole duty is, by the aid of a motor car, to perambulate the streets to see that the lamps are kept well up to the high standard specified.

The necessity for a specially constructed lantern to enable compliance to be constantly made with the stringent conditions imposed for street lighting—regarding which, as will have been already seen, the Municipality are keenly solicitous—led to the adoption of a lantern specially designed by Mr. Wellington, and made to his drawing by Messrs. Pintsch and Co., of Berlin. The lamp is called the "Bombay" improved; and it has also been largely installed, under Mr. Wellington's supervision, in the city from which it takes its title. The lamp has both primary and secondary air supplies; and it is absolutely wind, rain, and insect proof—all necessary qualities in Colombo. Excepting the main streets once in the afternoon (and this has no effect for more than, say, an hour), the streets are not watered; and therefore dust is plentiful. The proof that the lantern is wind proof is amply testified to by the tests made with one, fitted complete with mantle; the blast applied being by the aid of a powerful sirocco fan driven by a 14-horse power gas-engine. Altogether there are 2500 street lanterns in Colombo; and with the extensions now being made, there will be, by the end of this month, something like 90 miles of main pipes in the streets. As an example of good modern street lighting, Mr. Wellington is of opinion that Marine Parade in Colombo will be hard to beat—the 33 incandescent gas-lamps situated there being of 600-candle power each, and spaced only 50 yards apart.

Speaking of the carbonizing operations in Colombo, Mr. Wellington informs us that the production is 62 million cubic feet per annum, though there is capacity for turning out double the quantity when the necessity arises. It has been part of his work during late years to completely modernize the whole plant. Gibbons's latest type of regenerative settings have been adopted; and their working is highly spoken of by Mr. Wellington. The coal carbonized is mainly Indian coal; the Bengal variety of which, known as "Sanctoria" gas coal, is specially mined for three Gas-Companies—the Bombay, the Oriental (Calcutta), and the Colombo. The Company also use Japanese "Moji" coal, and a proportion of Australian ("Hetton") coal. The last-named Mr. Wellington speaks of as being very rich coal for gas making; and he knows of nothing like it in England. It is almost free from sulphur; only containing 0·23 per cent.

Another point that is highly interesting is the particular attention that we learn the Company give to the lighting fittings of their consumers; and they find they obtain and maintain, through their action, the goodwill of the consumers. It is a system of maintenance, including the supply of mantles; and it is practically a compulsory system. The Company keep a special ledger for the maintenance work; and they place from the charge for gas (say) 2 rupees per month to the credit of each ordinary consumer, and, on the debit side, are entered the cost of mantles and labour charges. An ordinary gas-jet is unknown in Colombo. There is, on a balance, a slight loss; but it is fully compensated for by the large increase in the sale of gas. The Company have the competition of an American Electricity Company; but they find this system of maintenance effectual in resisting inroads upon their business. In the mountain capital of Ceylon (Kandy), the Colombo Gas and Water Company also supply electricity for lighting and power purposes; and in conjunction with this branch a variety of electrical installation work is carried out.

In view of Mr. Wellington's return to this country, we may mention that he was trained in gas engineering and management at the Norwich works of the British Gaslight Company—under Mr. Fred. L. Linging, M.Inst.C.E.; and, in addition to his qualifications in gas, he is an Associate-Member of the Institution of Electrical Engineers, and a Fellow of the Chemical Society. We wish him success in his intention to now pursue work in the gas and electrical profession in this country.

PERSONAL.

At the meeting of the Institution of Civil Engineers last Tuesday, Mr. J. Ferguson Bell, the Engineer and Manager of the Derby Gas Company, was transferred from the class of associate member to that of member.

At the meeting of the Burton-on-Trent Town Council last Wednesday, it was decided, on the recommendation of the Gas and Electricity Committee, to fill the vacancy in the management of the gas-works caused by the death of Mr. F. L. Ramsden by retaining the services of Mr. J. Ferguson Bell, M.Inst.C.E., of Derby, to inspect the works four time in the year for the sum of fifty guineas, with a further payment of five guineas for any extra visit he may be required to make—his services to include the general supervision of the works and the advising of the Gas Committee; and by appointing Mr. Sydney Ramsden, son of the late Manager, as Assistant-Manager for one year, at a salary of £180, with house, &c., on condition that he devotes the whole of his time to the duties of the position.

OBITUARY.

We regret to record the sudden death last Wednesday, in his 68th year, of Mr. Alfred Todd, late Managing-Director of the Whitby Gas Company. Mr. W. M. Galleway is Secretary and Manager of the Company. Mr. Todd's connection with the Whitby Gas-Works dates back to the year 1860, when the undertaking was owned by the late Dr. Atkinson, of Hull. On the Company's incorporation in 1871, Mr. Todd was appointed Secretary, which position he held until the year 1899, when (on retiring from the secretaryship) he was appointed Managing-Director, and continued to act in that capacity until his death. He was a man of great energy and conspicuous ability; and though he never associated himself with public offices, he was untiring in his efforts on behalf of religious and philanthropic objects.

Dessau Vertical Retorts.

The "Journal für Gasbeleuchtung" for the 9th inst. has a short note on the Dessau vertical retorts, to the following effect: "The town of Ludwigshafen has decided to order from the Dessau Vertical Retort Company three settings of vertical retorts. These settings ought to be completed in good time for those who attend this year's meeting of the German Association of Gas and Water Engineers at Mannheim (which is on the opposite bank of the Rhine to Ludwigshafen) to witness them in operation. Including this order, the Dessau Vertical Retort Company have completed or have in hand 100 settings of vertical retorts, in the following places: Dessau, Potsdam, Oberspree (near Berlin), Dortmund, Cologne, Brandenburg, Duisburg, Mariendorf (near Berlin), Ludwigshafen, Offenbach, Barcelona, and Zürich. The installations at Barcelona and Potsdam are already in operation, and giving satisfaction to the Managers of the works. Of the other installations a large number will come into operation this month. The rapid introduction of this system of setting shows conclusively what favour the vertical retort enjoys with gas-works' administrations. We have from time to time directed attention to the importance of the vertical retort, and hope shortly to be in a position to give figures of their continuous use at various gas-works. The progress is so much the more gratifying as the constructors of the various competing English systems have not yet succeeded in getting beyond experimental trials."

MR. PATERSON ON LIGHT STANDARDS.

Observations by Mr. A. G. Vernon Harcourt.

On the occasion of the adjourned discussion on Mr. C. C. Paterson's paper, at the Institution of Electrical Engineers, on "Investigations of Light Standards and the Present Condition of the High-Voltage Glow-Lamp," a report of which appeared in the "JOURNAL" last week, it was mentioned by the President that a written communication on the subject had been received from Mr. A. G. Vernon Harcourt, and that it would be reserved for publication in the "Journal" of the Institution. As, however, Mr. Harcourt's remarks, of which we also received a copy, have been published in the current number of the "Electrician," we are free to complete our report by giving them.

Mr. Harcourt pointed out that the knowledge that atmospheric conditions have important influences on the candle power of flame standards is not quite recent. It must, he said, have been present to the minds of all who had thought out and arranged these standards, though an accurate determination of the correction to be applied for such atmospheric variations as were material, was no easy task. For the approximate measurement of the light of flames such as that of an oil-lamp or a gas-burner, the probability that the standard flame and that whose light it was used to measure would be similarly affected by atmospheric variations, was sufficient to make the correction of each unnecessary. When, however, a flame standard was to be used for standardizing glow-lamps, the corrections to be applied must be determined; and Dr. Liebenthal and Mr. Paterson had not, he thought, discovered an error, but had done an essential service which few had such good means of doing, in making these determinations. In the year 1885, he (the writer) examined the influence on the one-candle standard, which he had proposed, of variations in atmospheric pressure, by comparing it with a small glow-lamp, the current of which was adjusted by means of an electro-dynamometer. He found that the pentane flame, which gave a light of one candle when its height was 63·5 mm. and the atmospheric pressure was 760 mm., must be raised or lowered in inverse proportion to the rise and fall of the barometer for its light to be constant. His experiments upon the influence of atmospheric moisture began earlier—in 1879. He had then no glow-lamp for measurement, and only by the help of his one-candle flame compared the light given by a stored sample of coal gas, burning from a "London" argand burner in a box photometer when the air was dried and undried. Trays of quicklime were placed beneath the opening at the bottom of the box, and the light was 16·6 candles; the trays of lime were removed, and the light was 15·9 candles. Another day the gas was tested, and the yield of light was found to be 16·2 candles. The trays were then filled with slightly warm water, and the light was 15·4 candles; the trays were removed, and the light was 15·85 candles. Many such observations were made; but the attempts to measure the humidity with wet and dry bulb thermometers were unsatisfactory. It was certainly very difficult to treat the air in any way without interfering with its free flow, and thus affecting the light of the burner. He agreed with Mr. Paterson that it was best to wait for natural variations. There was still another atmospheric condition not named by Mr. Paterson, whose effect he hoped Mr. Paterson would investigate —viz., temperature. By the variation of this condition, the flame standard and the glow-lamp were both, however unequally, affected. A 10-candle gas-lamp was placed in the centre of a cylinder, 18 inches in diameter and 20 inches in height (within which was a long coil of metal pipe, through which hot or cold water could be run), lined inside with black cloth. An 8-inch opening in its lid gave free passage to the air. Two small lateral openings served for the beam to be measured and for observation of the flame. At temperatures of 36°, 32°, 29°, and 24°, the light was 10·6, 10·4, 10·3, and 10·2 candles. The temperature of flame was far removed from that of the air; but the principle of the hot blast came in, and particles of carbon were measurably brighter at (say) 1510° than at 1500°. That the glass envelope of a glow-lamp was hotter on a warm day was certain. The exchange of temperature between it and the filament through a nearly vacuous space, shown by the warmth which the glass maintained, though continually cooled by the air around it, must be much slower than that which was due to the free and rapid access of air to a flame. Was the effect of the temperature of the air around on the light of a glow-lamp measurable or not? If the answer was not already known, it could easily be obtained by experiment. Since, when the air was warmer, the proportion of steam in it was generally greater, and since the light of a flame was increased by warmth and diminished by a greater proportion of steam, these simultaneous variations must to some extent balance one another. But that which was needed, and which had already been partly supplied by Mr. Paterson, was a formula for correcting the photometric results obtained on comparing a glow-lamp with a particular flame standard, by which allowance would be made for the variations of pressure, temperature, and moisture, much as the observed volume of a gas measured over water was now corrected for these same variations.

Mr. James Dickie, of Irvine, N.B., the Secretary and Treasurer of the Irvine District Water Board and of the Irvine Gaslight Company, left personalty, apart from real or settled estate, entered at £54,631.

Measurement of Natural Gas.

Statistics of the quantity of natural gas consumed in the United States will be taken next year by the United States Geological Survey. Up to the present time, only the value of the gas has been ascertained. The adoption of this method will make it inconvenient, if not impossible, to refer back for purposes of comparison to the figures of previous years; but it will result in more direct knowledge of the capacity of gas areas to maintain a commercial supply of gas for a certain number of years. An effort will be made to collect and publish statistics showing the total acreage held by natural gas companies and that operated by them, with the total quantity of gas consumed in the different States. Owing to the fact that gas wells from different fields are connected to the main pipe-lines, and that gas is only measured where it is consumed, it is almost impossible to procure exact figures as to the quantity of gas produced from any particular district. When natural gas was first brought into use, an idea prevailed that the supply was inexhaustible. It was sold at low rates, and usually without measurement. This method encouraged waste, and was shortly abandoned by the larger companies. They introduced meters, and sold their gas at a rate per 1000 cubic feet by measurement. There were, however, so many smaller companies who did not measure the gas consumed, that it was impossible to secure reliable figures of the production and consumption of natural gas. For this reason, the statistics of this product have been collected in terms of value only. In taking value as a basis for statistical record, an incorrect idea is given of the actual production of the gas-fields. Experience has demonstrated that there is a limit to the production of all fields, and those who use the gas have learned that unnecessary waste must be prevented. At present nearly all the gas is sold by measurement; and it is believed that the time has come when it is possible to procure statistics of the quantity consumed.

The "Circular of Inquiry" Again.

It is some time since we have had to notice this trouble of the gas profession—the attempt to get "on the cheap" professional information that should be paid for by those requiring it. What possible claim can the Clerk to the Goole Urban District Council have upon (say) the Engineer and Manager of a South-Country Gas-Works to justify him asking replies to fifteen separate queries, and expecting an hour and more of an official's time to be thus occupied? It is not a question here of one engineer making a few personal inquiries in a friendly way of a brother engineer, but of a Corporation "office" official sending circulars to scores—possibly hundreds, as the forms are printed ones—of individuals in an altogether different sphere of life to himself and evidently expecting to get what he asks for. The covering letter says: "I propose to summarize the replies received," and it is to be hoped that the response to his invitation will be so scanty as not to justify the incurring of further expense in the matter. Here are the queries: 1.—Name of council, corporation, or company? 2.—Population of district? 3.—Number of gas consumers: (*a*) ordinary meters? (*b*) prepayment meters? 4.—If gas and water management combined, show apportioned: (*a*) salary of gas engineer and manager? (*b*) salary of water engineer and manager? (*c*) office staff allowed gas and water engineer and salaries paid each? 5.—Is salary inclusive, or is house or coal, gas, &c., provided? 6.—Total gas made? 7.—Gas sold? 8.—What is net cost per 1000 cubic feet of gas, delivered into holders, including the whole of the manufacture maintenance, and purification costs, less residuals? 9.—Water pumped per annum? 10.—Capital: (*a*) gas-works; (*b*) water-works. 11.—Price of gas per 1000 cubic feet? Water (*a*) domestic? (*b*) trade supply? 12.—Total income from all sources: (*a*) gas department? (*b*) water department? 13.—Total expenditure: (*a*) gas? (*b*) water? 14.—Are all extensions and alterations to gas or water plant carried out by engineer and manager, including preparation of plans and specifications, and is same included in his salary or special commission? 15.—Have you a consulting engineer to advise on all works as proposed?

Lord James of Hereford has accepted the unanimous invitation of the Coal Conciliation Board of England and North Wales to act as independent Chairman for the next three years, for which the Board has been reconstituted.

Sand in the water supply of the city of Evans (Colo.) has been overcome by a method described as follows by Mayor John H. Behrens: The supply was drawn originally from an 8-inch well sunk 108 feet deep into a stratum filled with soft water. The water rose in this casing within 10 feet of the ground surface, and was drawn from it with a large pump. The latter was so powerful that it sucked sand into the cylinder, where serious trouble was caused. A concrete curb or well, 12 feet in diameter and 36 feet deep, was then sunk, and four 6-inch wells were driven in its bottom to a depth of 106 feet into the stratum containing soft water. The bottom of the curb or well was then concreted to keep out the hard surface water, and the 6-inch pipes were cut off about 6 feet above the concrete bottom. The water issues from them freely into the large well, which serves as a suction chamber for the pump. This method of obtaining the water has prevented all the former troubles with sand.

ESTIMATING STREET ILLUMINATION.

An article by Dr. Hugo Krüss, of Hamburg, on methods of calculating the illumination provided in streets, appeared in a recent issue of the "Journal für Gasbeleuchtung;" and the following is a full summary of the author's remarks.

Dr. Krüss agrees with Professor Drehschmidt that the most suitable and correct method of ascertaining the amount of illumination consists in making measurements on the spot with a convenient form of photometer. But at the same time it is very interesting to calculate the illumination, because the investigator is then untroubled by irregularities in the behaviour of the lamps, and he can also, by theoretical considerations, obtain a better mental picture of the conditions which make for uniformity. The surface which may be regarded as receiving light is one lying in a vertical plane parallel with the direction of the street; for, as Dr. Drehschmidt has pointed out, satisfactory street illumination depends less on the light that falls upon the ground than on that which impinges upon an imaginary vertical surface crossing the road obliquely. When a person reads or studies a plan, he intentionally places himself in such a position that the object receives the best illumination; but in walking or driving along a street he is chiefly dependent on the light falling on those parts of pedestrians or vehicles that are turned towards him.

Calculation of the illumination is an easy matter. In the first place suppose the source of light, J, and the receiving surface, B, are both in the centre of the carriage way, as represented by fig. 1. Let the vertical distance of the receiving surface above the ground level be h, the vertical height of the light above B be H, the direct distance between light and receiving surface be E, and the horziontal distance between the base of the light and the surface be L. If the illuminating power of the light is J, the illumination received by the surface B, and the angle with the normal at which the rays strike the surface α; then

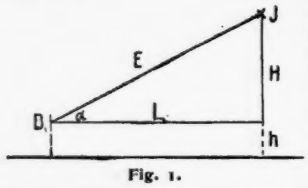


Fig. 1.

$$\tan \alpha = \frac{H}{L},$$

$$E = \frac{L}{\cos \alpha},$$

$$B = \frac{I}{E^2} \cos \alpha = \frac{I}{L^2} \cos^3 \alpha.$$

But suppose the receiving surface is at some distance from the vertical axis of the light across the street as well as along it—the light being in the centre of the carriage way and the receiving surface above the footpath—as represented in [the three-dimensional] fig. 2. Let the distance across the street from the light J to a line L drawn normally in respect of the receiving surface be D, and the diagonal of the vertical rectangle formed from D and H be F; then E is the hypothenuse and F and L [not marked in the diagram] are the other two sides of a right-angled triangle. Hence

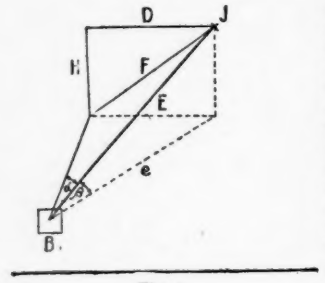


Fig. 2.

$$F = \sqrt{(D^2 + H^2)}$$

$$\tan \alpha = \frac{F}{L};$$

B being calculated as before. It should be noticed that the angle below the horizontal at which the rays issue from the source of light—viz., β—is not identical with the angle α at which they strike the receiving surface. For

$$\tan \beta = \frac{H}{e}, \text{ where}$$

$$e = \sqrt{(L^2 + D^2)}.$$

The additional amounts of light which fall upon the imaginary vertical receiving surfaces by reflection from the fronts of houses and the plate-glass windows of shops are better ignored in making the calculations, because these factors are too uncertain to reckon upon.

The results obtained with the aid of the foregoing formulæ become specially instructive if numerical data are employed which correspond with practical conditions; and therefore in the following lines values are used almost identical with those obtaining in Leipzigerstrasse, Berlin, where the illumination has already been measured by Dr. Drehschmidt. The lamps may be assumed to be erected either centrally in the carriage way, as shown in fig. 3, or alternately on either side, above the kerbs, as shown in fig. 4, at a distance of 19 ft. 8 in. from the centre—the actual distance in Leipzigerstrasse varies, it seems, from 18 ft. to 18 ft. 9 in. The receiving surfaces may either be in the centre of the roadway or along the the kerbs, in the positions indicated by the inner parellel lines of the diagrams. The lamps may be taken at their actual height above the ground of 29 ft. 6 in., or 24 ft. 6 in. above the receiving surfaces; and, for simplicity, they may be assumed to be 30 metres (33 yards) apart, instead of the actual distance of 36 yards. Figs. 3 and 4 are drawn longitudinally to scale, the small graduations being 5-metre distances.

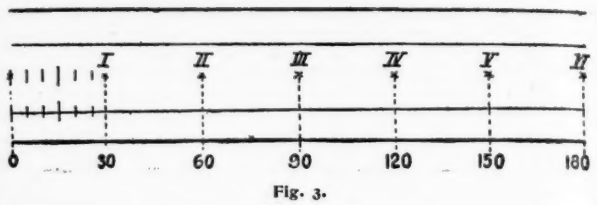


Fig. 3.

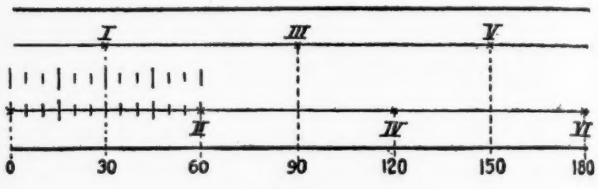


Fig. 4.

Four different arrangements may, therefore, be imagined: (*a*) Both lamps and receiving surfaces centrally over the roadway, (*b*) the lamps over the roadway and the receiving surfaces over the kerbs, (*c*) the lamps over the kerbs on alternate sides, and the receiving surfaces centrally over the roadway, and (*d*) both receiving surfaces and lamps over the kerbs—the lamps being on alternate sides of the road. From the present aspect cases (*b*) and (*c*) are identical, because the illumination at any particular spot depends only on the distance of the light and the angle at which the rays issue from it. The practical advantage of having the lamps on either side alternately—due to the avoidance of shadows all lying in the same directions—does not affect the present question. In order to ascertain the illumination falling on the receiving surfaces in cases (*a*), (*b*), and (*c*), calculations are made for positions along the street every 5 metres from the zero point, at the extreme left of the two figures, to a spot 5 metres from the first lamp, and then every 1 metre to its base. Further calculations between Lamps I. and II. are not necessary, since (as Table I. shows) the figures recur. In case (*d*), however, the calculations must be made over a double distance—*i.e.*, as far as Lamp II., in the manner indicated by Table III. The figures given in the tables are meterkerzen or lux—a lux being equal to 0·0845 candle-foot. The figures contained in Table I. are plotted diagrammatically in fig. 5, those of Table II. in fig. 6, and those of Table III. in fig. 7.

Table I.

Lamp.	Angle of Emission.	Position of Receiving Surface.										
		0	5	10	15	20	25	26	27	28	29	30
I.	14·0—90·0	2·03	2·81	4·10	6·36	10·24	13·66	13·03	11·39	8·55	4·73	..
II.	7·1—14·0	0·54	0·64	0·77	0·95	1·19	1·56	1·61	1·70	1·80	1·91	2·03
III.	4·6— 7·1	0·24	0·27	0·31	0·35	0·40	0·46	0·48	0·49	0·51	0·53	0·54
IV.	3·6— 4·6	0·14	0·15	0·16	0·18	0·20	0·22	0·22	0·23	0·23	0·24	0·24
V.	2·8— 3·6	0·09	0·09	0·10	0·11	0·12	0·13	0·13	0·13	0·14	0·14	0·14
VI.	2·4— 2·8	0·06	0·07	0·07	0·07	0·08	0·09	0·09	0·09	0·09	0·09	0·09
VII.	..	..	..	..	..	..	..	..	..	..	..	0·06
Total . . .		3·10	4·03	5·51	8·02	12·23	16·12	15·56	14·03	11·32	7·64	3·10

Table II.

Lamp.	Angle of Emission.	Position of Receiving Surface.										
		0	5	10	15	20	25	26	27	28	29	30
I.	13·8—51·3	1·90	2·60	3·65	5·31	7·50	7·88	7·10	5·89	4·24	2·22	..
II.	7·1—13·8	0·53	0·63	0·76	0·92	1·15	1·46	1·54	1·63	1·72	1·81	1·90
III.	4·8— 7·1	0·24	0·27	0·31	0·35	0·40	0·46	0·47	0·49	0·50	0·52	0·53
IV.	3·6— 4·8	0·14	0·15	0·16	0·18	0·20	0·22	0·22	0·23	0·23	0·24	0·24
V.	2·9— 3·6	0·09	0·09	0·10	0·11	0·12	0·13	0·13	0·14	0·14	0·14	0·14
VI.	2·4— 2·9	0·06	0·06	0·07	0·07	0·08	0·08	0·08	0·09	0·09	0·09	0·09
VII.	..	..	..	..	..	..	..	..	..	..	..	0·06
Total . . .		2·96	3·80	5·05	6·94	9·45	10·23	9·54	8·47	6·89	5·02	2·06

It should be noted that, although these figures and curves apply primarily to the numerical conditions previously stated, yet they may be used in considering the illumination in any street, provided only that the ratio between the height of the lamps above the receiving surfaces to the distance between the lamps, remains unaltered at the specified value—viz., as 7·5 : 30, or as 1 : 4. If the lights are more powerful, or if they are lower and correspondingly closer together, the figures only require multiplying by a constant factor—the curves remain the same

TABLE III.

Lamp.	Angle of Emission.	Position of Receiving Surface.																				
		0	5	10	15	20	25	26	27	28	29	30	35	40	45	50	55	56	57	58	59	60
I.	13·1—32·0	1·45	1·78	2·16	2·49	2·50	1·70	1·42	1·10	0·74	0·38	..	..	..	..	..	..	..	..	..	..	..
II.	7·1—90·0	0·54	0·64	0·77	0·95	1·19	1·56	1·61	1·70	1·80	1·91	2·03	2·81	4·10	6·36	10·24	13·66	13·03	11·39	8·55	4·75	..
III.	4·7—13·1	0·23	0·26	0·29	0·33	0·37	0·43	0·44	0·45	0·47	0·48	0·49	0·57	0·67	0·80	0·96	1·18	1·22	1·27	1·33	1·38	1·45
IV.	3·6— 7·1	0·14	0·15	0·16	0·18	0·20	0·22	0·22	0·23	0·23	0·24	0·24	0·27	0·31	0·35	0·40	0·46	0·48	0·49	0·51	0·53	0·54
V.	2·9— 4·7	0 09	0·09	0·10	0·11	0·12	0·14	0·14	0·14	0·15	0·15	0·15	0·16	0·18	0·19	0·21	0·22	0·22	0·22	0·22	0·22	0·23
VI.	2·4— 3·6	0·06	0·07	0·07	0·07	0·08	0·09	0·09	0·09	0·09	0·09	0·09	0·10	0·10	0·11	0·12	0·13	0·14	0·14	0·14	0·14	0·14
VII.	3·0— 2 9	0·04	0·05	0·05	0·05	0·05	0·06	0·06	0·06	0·06	0·06	0·06	0·07	0·07	0·08	0·08	0·09	0·09	0·09	0·09	0·09	0·09
VIII.	..	..	..	..	..	..	..	..	..	..	..	..	0·04	0·05	0·05	0·05	0·05	0·06	0·06	0·06	0·06	0·06
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·04
	Total . . .	2·55	3·04	3·58	4·18	4·51	4·20	3·98	3·77	3·54	3·31	3·10	4·03	5·48	7·94	12·06	15·80	15·24	13·57	10·90	7·15	2·55

in character, but become correspondingly steeper, because the change causes greater differences to occur in the quantities of illumination falling upon individual receiving surfaces placed in similar positions along the street.

Fig. 5 shows that when the lamps are disposed centrally, the illumination falling upon a vertical surface also in the centre of the road increases as the lamp is approached, to a maximum about 15 feet distant; but it then falls sharply to the foot of the post, because that particular lamp no longer throws much (or any) light upon the road surface. If the lamps are suspended alternately over the right and left kerbs, and the receiving surfaces are in the centre of the carriage way, or *vice versa*, fig. 6 shows the illumination to vary in a similar manner, but the differences are not so wide. When the lamps are spaced alternately over the two kerbs and the receiving surfaces are all above one kerb, the effect of fig. 7 is produced. The illumination first increases slightly to the place where Lamp I. becomes ineffective; then drops somewhat; and afterwards rises to a maximum about 15 feet before Lamp II. is reached. The maximum is higher than that in the corresponding position of fig. 6, because in fig. 7, which is case (*d*), the more distant lamps throw light upon a surface at point "55" at a smaller angle with the normal than do the distant lamps in fig. 6, which represents case (*b*) or (*c*).

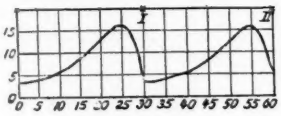


Fig. 5.

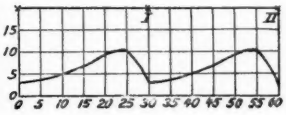


Fig. 6.

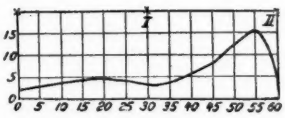


Fig. 7.

For the purpose of judging the degree of uniformity in the illumination, the relationships of the maximum and minimum illumination to the mean illumination have to be considered. To do this, it is necessary to ascertain the mean illumination by a process of integration over the whole illuminated surface, in the manner already adopted by Herr L. Bloch. This investigator has also used the arithmetical mean between the maximum and minimum illumination as the true mean illumination, which is manifestly not correct. However, in the case of street lighting, as the true mean illumination is unknown, and the spots of maximum and minimum illumination are so close together that the differences are quite conspicuous to the eye, the arithmetical mean may be taken. Hence we have—

	Maximum.		Minimum.		Arithmetical Mean.
Case (*a*)	15·56	..	3·10	..	5·02
,, (*b*)	10·23	..	2·96	..	3·79
,, (*c*)	10·23	..	2·96	..	3·79
,, (*d*)	15·74	..	2·55	..	6·17

The differences are largest in the last case; but a study of fig. 7 will show that for a distance exceeding half that investigated, the illumination is much more uniform in case (*d*) than in any of the others.

Comparative Results.

A comparison may now be made between the results of Dr. Krüss's calculations and Dr. Drehschmidt's measurements. The fact that the arc lamps in Leipzigerstrasse, Berlin, are 36 yards apart, instead of 33 yards as Dr. Krüss has supposed them to be, is not of great consequence. But on the other hand, as Dr. Drehschmidt made no measurements between a spot at the base of the lamp and one 34 feet off, the position of maximum illumination escaped him. In his first table (Table IV.),* Dr. Drehschmidt records the illumination falling upon a vertical surface in the centre of the carriage way placed at right angles to the direction of the road—the lamps being also in the centre of the road. He quotes the amount of light falling on both sides of each surface, terming all the sides which point in one direction the "right" sides, and those pointing in the opposite direction, the "left" sides. He then takes the average of the light falling upon the two sides of each surface, and calls it the mean illumination received by that surface.

* See "JOURNAL," Vol. XCVI., p. 465.

TABLE IV.—*Drehschmidt's Figures.*

Position of Surface.	Illumination Received by a Vertical Surface in the Centre of the Road.		
	Right.	Left.	Average.
33	1·25	2·05	1·63
22	5·51	3·18	4·34
17	3·47	4·39	3·93
11	2·28	6·81	4·54
0	1·34	1·60	1·47

This method of calculating the mean illumination falling upon each surface, however, cannot be correct, unless the surfaces are translucent. Actual objects in a road are opaque, and are rendered visible to a human eye by the light falling on one side of them only. Hence the proper way of manipulating the figures obtained by Dr. Drehschmidt is shown in the third, fourth, and fifth vertical columns of Table V., where, it will be seen, the "left-hand" figures are reversed in order. In Table V., therefore, the pairs of illumination values whence the several averages are extracted represent the amounts of illumination falling upon the opposite sides of those two (different) surfaces which occupy the same relative positions in respect of the lights when the road is regarded in opposite longitudinal directions.

TABLE V.

Position of Surface.		Illumination Received by Vertical Transverse Surfaces in the Centre of the Road.				
		Drehschmidt's Measurements.			Krüss Calculated.	Drehschmidt Reduced.
Drehschmidt.	Krüss.	Right.	Left.	Mean.		
0	0	1·34	2·05	1·69	3·10	3·39
11	10	2·28	3·18	2·73	5·51	5·48
17	15	3·47	4·39	3·93	8·02	7·89
22	20	5·51	6·80	6·16	12·23	12·35
33	30	1·25	1 60	1·42	3·10	2·85
	Totals			15·93	31·96	31·96

These pairs of right and left hand values ought theoretically to be equal in each case. The differences between them must be explained on the ground that the lamps were developing a different amount of light at the moment the illumination was measured in one direction from that which they were emitting when the measurement in the opposite direction was carried out. On comparing the totals at the base of Columns 5 and 6, it will be evident that the electric arc lights in Leipzigerstrasse, which are fitted with ground-glass globes, only emit about half as much light—viz., 1000-candle power—as is presumed to be the case in Dr. Krüss's calculations. The factor obtained by dividing the total of Column 6 by the total of Columns 3 and 4 is 2·01. If Dr. Drehschmidt's mean results in Column 5 are multiplied by this factor, so as to obtain a grand total equal to that given by Dr. Krüss's calculations, the last column of Table V. is obtained; and it will be found that the individual figures agree very closely, each to each.

Hence it must be concluded that the arc lamps employed in Leipzigerstrasse radiate their light very uniformly all round, and that any remaining inequality is eliminated by the obscured globes. On comparing, in a precisely similar fashion to that adopted in Table V., Dr. Drehschmidt's actual figures with Dr. Krüss's calculated values for transverse vertical surfaces situated over the footways, Table VI. is arrived at.

TABLE VI.

Position of Surface.		Illumination Received by Vertical Transverse Surfaces Situated over the Footpaths.				
		Dreschmidt's Measurements.			Krüss Calculated.	Dreschmidt Reduced.
Drehschmidt.	Krüss.	Right.	Left.	Mean.		
0	0	1·51	2·28	1·90	2·96	3·52
11	10	2·02	3·00	2·51	3·80	4·65
17	15	2·88	3·17	3·27	6·94	6·06
22	20	4·96	5·08	5·02	9·45	9·30
33	30	1·14	1·64	1·39	2·96	2·58
		Totals . . .		14·09	26·11	26·11

Here the factor required to render the total of Column 5 equal to the total of Column 6 is 1·85 instead of 2·01. Dr. Drehschmidt has thus found the illumination over the footways to be proportionately 9 per cent. higher—a difference presumably due to reflection from the house-fronts, which is a factor ignored by Dr. Krüss. The individual figures in the last two columns do not agree as well in Table VI. as in Table V. The reason for this is not clear, but perhaps reflection has something to do with it.

Most Advantageous Distribution.

It may now be interesting to consider, with the aid of the foregoing data, how the rays of light issuing from any source should be distributed over the various angles of a vertical plane if the illumination in a road is to be uniform at all points.* On referring to Table I., it will be seen that when both lamps and receiving surfaces are in the centre of a road, light falls upon the different receiving surfaces from Lamp I at all angles between 14° and 90°—*i.e.*, over an angular distance of 76°. From the other lamps, the corresponding angles are from 2·4° to 14°. But only Lamp II. throws sufficient light on the surfaces between points "0" and "30" to be worth attention.

TABLE VII.

—	Position of Receiving Surface.					
	0	5	10	15	20	25
Angle of emission from Lamp I. . . .	14·00	16·70	20·60	26·60	36·90	56·30
Illumination from Lamp I.	2·03	2·81	4·10	6·36	10·24	13·66
Reducing factor	1·00	0·67	0·41	0·23	0·11	0·05
Reduced illumination from Lamp I. . .	2·03	1·88	1·69	1·44	1·11	0·64
Illumination from Lamps II.–VI. . . .	1·07	1·22	1·41	1·66	1·99	2·64
Total illumination	3·10	3·10	3·10	3·10	3·10	3·10

Now, the amount of illumination falling upon the surfaces might be altered by changing the proportion of light radiated from the sources between the angles 0° and 14°; but it would not be advisable to do so. A reduction in the amount of light emitted within these angles would not be advantageous, because Lamp II. is already throwing a valuable quantity of illumination upon the surfaces by the time that position "29" is reached. An increase in the amount of light emitted within the same angles would not be advantageous, because, were it so increased, the effect of Lamp I. would have to be diminished more than is otherwise necessary. Thus in imagining the ideal lamp for street illumination, it is the rays emitted between the angles 14° and 90° that need correction to ensure uniformity. As a basis for the calculation, it is better to take the minimum value shown in Table I.—*i.e.*, 3·10 meterkerzen; for if either the maximum or the mean be selected, the ideal emission curve becomes hopelessly impossible.

*Dr. Krüss admits that this inquiry is as illusory as the endeavours now being made in England to design an ideal gas-retort in the lecture hall, without stopping to ask whether manufacturers would be able to construct the article when finally imagined.

On this basis, Table VII. is arrived at, where the item "Reduced Illumination from Lamp I." means the quantity of light which that lamp must throw upon the receiving surfaces at the different stated positions if the illumination at all positions is to be identical. The precise value for the uniform illumination—viz., 3·10 meterkerzen, has no significance at all beyond being the minimum afforded in the conditions already described. In Table VII. both lamps and receiving surfaces are supposed to be above the centre of the road.

The curve in fig. 8 is drawn from the figures given in Table VII., and shows that the ideal street-lamp must throw as little light as possible in a downward direction. Hence sources of light such as the flame arc are specially unsuitable for the purpose in view, as indeed experience has already proved to be the case. Reflectors which throw the light downwards are also to be avoided, and such are to be chosen as reinforce the light naturally emitted at small angles below the horizontal. An economical light of the kind indicated by fig. 8 is perhaps hardly to be produced; but it might possibly be imitated by placing round the light a system of Fresnel's lenticular rings, like those employed in lighthouses.

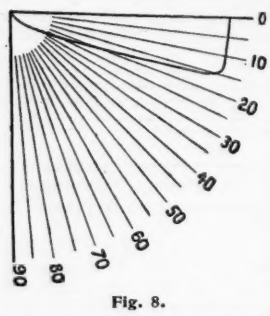


Fig. 8.

The work recently carried out by Dr. Drehschmidt shows that the Welsbach gas-light approaches more nearly to the curve in fig. 8 than the electric arc, for the former throws most of its light horizontally. The curve also explains why the illumination in Friedrichstrasse, Berlin (which is provided with Lucas lamps), has been found by Dr. Drehschmidt to be much more uniform than that prevailing under the electric arcs of Leipzigerstrasse. The newest types of Lucas lamp, examined by Herr Wedding, also approximate closely to the ideal curve.

TABLE VIII.

—	Position of Receiving Surface.					
	0	5	10	15	20	25
Angle of emission from Lamp I. .	13·80	16·30	19·80	24·90	32·70	43·80
Illumination from Lamp I. . . .	1·90	2·60	3·65	5·31	7·50	7·88
Reducing factor	1·00	0·66	0·56	0·28	0·15	00·8
Reduced illumination from Lamp I.	1·90	1·72	2·04	1·49	1·12	0·62
Illumination from Lamps II.-VI. .	1·06	1·20	1·40	1·63	1·95	2·35
Total illumination . . .	2·96	2 92	3·44	3·12	3·07	2 97

Table VIII. indicates the ideal distribution of light from lamps placed centrally over the carriage way, so as to ensure uniform illumination upon surfaces situated over the kerbs, or *vice versa;* and Table IX. similarly specifies the best distribution if the lamps are alternately over the two kerbs, and the receiving surfaces over one of them. As stated before, all these calculations are valid wherever the distance between two neighbouring lamps is four times the vertical distance of the lamps above the vertical receiving surfaces. If the lamps are the same distance apart, but are less highly elevated, the illumination is less uniform, because the angles of incidence in all positions of the receiving surfaces are wider, and therefore the illuminating power is greater. As the surface nears the lamp, the illumination received increases by virtue of the diminished distance, but decreases by virtue of the narrower angle of incidence; and if the latter effect is less powerful than the former, the illumination becomes less uniform.

TABLE IX.

—	Position of Receiving Surface.											
	0	5	10	15	20	25	30	35	40	45	50	55
Angle of emission from Lamp I.	13·10	15·10	17·80	21·10	25·40	30·60	..	..	..	..	..	..
Illumination from Lamp I.	1·45	1·78	2·16	2·49	2·50	1·70	..	..	..	..	..	..
Reducing factor	1·00	0·78	0·60	0·39	0·28	0·17	..	..	..	..	..	..
Angle of emission from Lamp II. . . .	7·10	7·80	8·20	9·50	10·60	12·10	14·00	16·70	20·60	26·60	36·90	56·30
Illumination from Lamp II.	0·54	0·64	0·77	0·95	1·19	1·56	2·03	2·81	4·10	6·36	10·24	13·66
Reducing factor	1·00	1·00	1·00	1·00	1·00	1·00	1·00	0·67	0·41	0·23	0·10	0·05
Reduced illumination from Lamp I. . .	1·45	1·39	1·30	0·97	0·70	0·29	..	..	..	..	..	..
,, ,, ,, ,, II. . . .	0·54	0·64	0·77	0·95	1·19	1·56	2·03	1·88	1·68	1·46	1·02	0·68
Illumination from Lamps III.-VII. . . .	0·56	0·62	0·65	0·74	0·82	0·94	0·97	1·22	1·38	1·58	1·82	2·14
Total Illumination	2·55	2·65	2·72	2·66	2·71	2·79	3·10	3·10	3·06	3·04	2·84	2·82

RUBBER PACKING FOR JOINTS IN MAINS.

As recently reported in the "Journal für Gasbeleuchtung," a paper was read by Herr Burgemeister, of Celle, on the above-mentioned subject before the last meeting of the Association of Gas and Water Engineers of Lower Saxony.

The author began his remarks by admitting that in certain circumstances wrought iron or Mannesmann pipes were preferable to cast iron; but since cast iron undoubtedly lasted longer when buried in earth, it seemed a mistake not to use that material as often as possible, more particularly so because fractures could be avoided by making the joints in a proper manner, unless the ground were excessively treacherous. Herr Burgemeister stated that he had used nothing but cast iron during the 36 years he had managed the Celle Gas-Works, and had never experienced a single fracture. A short time ago, opportunities had arisen for inspecting some of the cast-iron pipes laid, without any preservative coating, 50 years ago. They exhibited no signs of corrosion, and only a few spots of rust; and they were evidently capable of lasting another 50 or 100 years, and were used over again, except in places where the growth of the district necessitated larger pipes being laid. These pipes, too, were cast horizontally, and therefore varied in thickness from 2 or 5 millimetres on one side to 15 millimetres on the other.

Fig. 1.

Fig. 2.

Fig. 3.

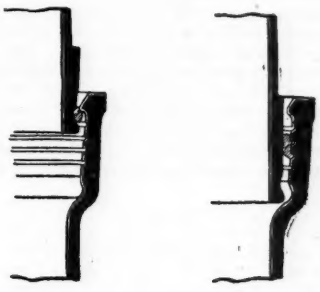


Fig. 5.

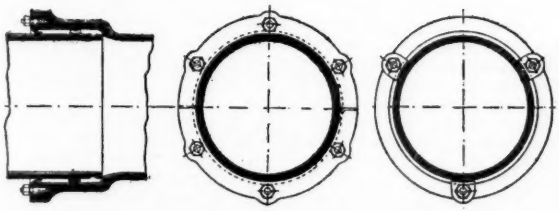


Fig. 4. Fig. 6.

According to the author, rubber rings were first used for gas-mains at Worcester in 1847; the type of joint employed being that shown in fig. 1. They behaved excellently. In 1860, Herr Ziegler described a joint shown in fig. 2, which, during a lifetime of ten years, had only allowed leakage to occur at the rate of 3·17 per cent. per annum. The second design was an improvement on the first, because the absence of the collar cast at the extremity of the spigot rendered the joint more flexible. The rubber washers, however, were often insufficiently thick; they should be of such size as to be compressed to nearly half their natural thickness when in position. Joints made in this manner had never become popular in North and Central Germany, perhaps because unsatisfactory results had followed the employment of inferior rubber. In South Germany, many distributing systems were provided with them. All the joints on the Hanau gas-main up to 6 inches in diameter were of the pattern shown in fig. 2. In 1885, the author laid a small water-main for the town of Enzweiler, near Birkenfeld, with rubber-jointed cast-iron pipes, which was still in good condition. A few months ago, tests were carried out at the Friedrich Wilhelm works at Mülheim on various types of rubber joints. Two 13-feet lengths of 12-inch pipe, joined in the manner shown in fig. 3, were put under a water pressure of three atmospheres, and were safely bent through a distance of 6·7 inches from the straight without leaking. Four similar lengths were bent through a distance of 9 inches. These tests seemed to show sufficient flexibility even for employment in the shifting soil of Westphalia and Silesia.

Another joint recently brought out by the same firm, and mentioned by the speaker, is shown in fig. 4. A flange is screwed on to the end of the socket, and bears against a counter flange, rectangular in section, cast on the spigot in the proper position. Thus the rubber ring is completely enclosed. A different arrangement is represented in fig. 5. Two metal rings are slipped on the spigot, the first having a bevelled edge pointing towards the socket pipe, and being preferably made of bronze. When the pipes are connected up, and the bevelled ring is driven forwards, it forces its neighbour into a recess cast in the socket. Thus the joint is capable of expansion and bending; but it would probably not bear taking apart, and would perhaps be too expensive to use. In the author's opinion, a perfectly satisfactory rubber joint can be cheaply constructed by slightly modifying figs. 1 or 2 and 4. A simple ring should be bolted by three studs, as shown in fig. 6, on to the face of the socket, so that its inner edge may bear against the collar on the spigot shown in fig. 2; and the collar should be made so much thicker that a space of only about 2 or 3 mm. is left between its periphery and the inner surface of the socket. This arrangement gives sufficient lateral and longitudinal play, while the ring prevents the pipes being forced apart by the pressure (of the water) within them.

It is most important, Herr Burgemeister added, that all the washers should be made of the best quality Para rubber, as inferior grades quickly perish; and they should be a trifle large rather than the least degree small. High compression of the rings is, of course, more necessary in the case of pipes delivering water than in that of gas-mains. Washers of good rubber which had remained in service for 15 or 17 years were exhibited to the meeting, and would have been used again by the speaker if he had not been compelled to lay pipes of larger diameter.

Herr Burgemeister concluded with the statement that he had never discovered a rubber jointed socket joint to become leaky in all his thirty years' experience, though numerous joints made with lead had failed, and some of the pipe lengths had broken.

Progress of De Brouwer Stoking Machinery.

Messrs. W. J. Jenkins and Co., Limited, of Retford, have received from the Derby Gas Company, through Mr. J. Ferguson Bell, M.Inst.C.E., their Engineer, an order to fit up a large retort-house at their Litchurch works with the most improved De Brouwer coal-projector and with "Jenkins De Brouwer" pusher discharging machines. For economy of working in summer, they have ordered one of Jenkins's complete stokers, whereby the whole work of charging and discharging the retorts will be done by one man working one machine. The order includes the supply of gas-engine driven electric generators in duplicate; the engines being of sufficient power to drive the dynamos and the whole of the necessary waggon-tipping and coal and coke handling plant. The last-named plant completes the retort-house, which has for some years been partly fitted with De Brouwer coke-conveyors and storage hoppers. This large extension of the use of the "D. B." projector and pusher is peculiarly gratifying to the Contractors, as it will no doubt be remembered that Mr. Bell was the first gas engineer in this country to give the new machines a trial. Messrs. Jenkins also inform us that they have in hand at the present time a large order for stage floors, retort-bench fittings and mains, coal and coke handling plants, and stoking machinery for the Christchurch (New Zealand) Gas Company, stoking machinery and generating plant for the Metropolitan Gas Company of Melbourne, coal-handling plant and stoking machinery for the Lincoln Corporation, and stoking machinery for the Southampton Gas Company; and they have just started an installation of stoking machinery at Montreal. In connection with the preceding particulars of the extension of the "D. B." plant, it may not be uninteresting to give the following record of progress since the introduction of the projector and pusher in 1903.

	Projectors.	Pushers.
Great Britain	42	24
New Zealand	2	2
Australia	1	1
Canada	1	1
Buenos Ayres	1	—
(By Messrs. W. J. Jenkins and Co., Limited.)		
Germany	22	4
France	22	19
Belgium	6	6
Italy	2	2
America	4	4
Holland	6	6
Spain	3	2
Switzerland	1	1

LONDON AND SOUTHERN JUNIOR ASSOCIATION.

Visit to the North Middlesex Gas Company's Works.

Last Saturday afternoon, the members of the London and Southern District Junior Gas Association—to the number of about 35—headed by the President, Mr. W. Upton, paid a visit of inspection to the works of the North Middlesex Gas Company, at Mill Hill. Unfortunately, Mr. L. Trewby, the Company's Engineer and General Manager, was unable to be present to receive the party; but the visitors were met on their arrival by Messrs. P. J. Colman, J. R. Gale, and S. A. Carpenter, who then proceeded to show them round the works and explain the various points of interest. In addition to this, Mr. Trewby had thoughtfully had the main features set forth in a little booklet, which was of great assistance to the members in their inspection. The time at disposal, however, proved all too short; for when the party sat down to tea (to which they had been kindly invited), there were still some portions of the works—the purifiers, for instance—which had not been visited. But the best possible use had been made of the afternoon; and when darkness had quite set in, the members left, well pleased both with what they had seen and at their cordial reception.

The North Middlesex Gas Company serve a large area, the districts supplied comprising Mill Hill, Hendon, Church End Finchley, part of North Finchley, and East Finchley; and though building has been, and is still, going on very rapidly, there yet remains ample room for further development of the neighbourhood. The consumption of gas has been steadily increasing; and the quantity sold last year amounted to 156 million cubic feet. The charge to ordinary consumers is 3s. 8d. per 1000 cubic feet, and to prepayment meter users 4s. 4½d.—that is 19 feet for 1d. The works are close to Mill Hill Station of the Great Northern Railway; and the Company have a siding, from which the coal-trucks are drawn into the store (alongside the retort-house) on overhead rails by means of hydraulic capstans. The retort-house contains six beds of seven through retorts 22 in. by 16 in. and 20 feet long; and the house is at present being extended, in order that three more similar beds may be put down. The furnaces are direct-fired; and in the extensions now in progress this system will be adhered to, because of its advantages of easy attention and relatively low initial cost. The make of gas per mouthpiece is from 5500 to 6000 cubic feet, and per ton 11,500 cubic feet; while the fuel consumption is 20 per cent.

On leaving the retort-house, considerable interest was evinced in a water-softening plant, which has been fitted up over the boilers. This was erected by Messrs. Mather and Platt, and is the Archbutt-Deeley process—the water being treated with 1¾ lbs. of lime and 7 oz. of alkali per 1000 gallons. There are three boilers; the largest of which is fitted with Lee, Howl, and Co.'s forced-draught apparatus, and the other two with Meldrum's. The two exhausters—passing 60,000 and 30,000 cubic feet per hour respectively—are by Messrs. George Waller and Son. There are installed two of Messrs. Humphreys and Glasgow's 250,000 cubic feet per day carburetted water-gas plants; and at the present time the coal gas and water gas are exhausted and purified together. This arrangement is not, however, found to be a satisfactory one; and consequently steps are being taken to put down two more exhausters this summer. When this has been done, the coal gas will be purified separately from the water gas, and the two will be mixed at the inlet of the holder. The carburetted water-gas engine-room contains two turbine blowers, a hydraulic engine for working the capstans already referred to, and scrubber, oil, and condenser pumps for the water-gas plant. The accumulator for the capstans throws a pressure of 800 lbs. per square inch. In the other engine-room, there are two turbine pressure-raisers, having a capacity of 120,000 cubic feet per hour. These turbines have been installed in order to save the expense of laying a larger main to supply the East Finchley district; and they work on a 10-inch main at a pressure of 10 inches, from dusk till 10 p.m. The main is not tapped until East Finchley has been reached, which is about 3½ miles away; and then, by the friction in the main, the pressure of the gas is reduced to 3½ to 4 inches. By the side of the turbines, there is a small blowing apparatus originally used for the purpose they now fulfil; and this is employed to run the gas from the small holder to the large one.

There is a pump-house, in which are the liquor and tar pumps; and an overhead tank contains the waste water from the works, which is used for quenching coke. In addition to the tar separating and cooling tank, there are two oil-tanks, of a capacity of 8460 and 12,972 gallons respectively. In the water-gas meter-house, there are two station-meters—one of 30,000 cubic feet capacity in use, the other of 15,000 feet in reserve. The coal-gas meter house is provided with a meter having a capacity of 60,000 cubic feet. The two tower scrubbers are 55 feet high, and filled with boards; while each has a tar-extractor at the bottom. An old tower scrubber on the works is now used for extracting water from the water-gas tar. It has a steam-coil inside; and by means of the heat, and also through the weight of the tar, the quantity of water has been got down to 1 per cent. The stores, which are excellently arranged, contain everything required on the district and works. Each fitter has a separate bin; and he brings in his orders at night, and finds what he requires placed ready for him in the morning. In the governor-house, there are two governors—one an 18-inch, and the other an 8-inch; the latter being used in connection with the pressure-raisers. With regard to the purifiers, the covers on one set are held down by Paddon's patent arrangement; while the second set are luteless. Oxide of iron only is now used for purification. There are three holders, the capacities of which are 61,600 cubic feet, 234,000 feet, and 454,000 feet; the smallest being used solely as a relief holders for the water gas. Other departments on the works are a machine shop (at present incomplete), fitters' shop, stove shop and carpenters' shop, and stables, &c. Over the general offices, laboratory, and photometer-room, are the private offices. Care for the comfort of the employees is seen in a well-appointed lavatory, fitted with bathing accommodation, a mess-room, and a further large room to be used for reading and recreation.

It was in the latter that tea was served, at the conclusion of which the President proposed a very hearty vote of thanks to the Company for having placed their works at the disposal of the Association, and to the members of the staff who had shown them round and explained everything. He remarked that it was in a small works like these that one could get the best grasp of the whole of the operations that were necessary to the production of gas to-day. He thought that it was in the smaller works that the greatest facilities existed for experiments, and for the carrying out of any individual ideas that the manager might possess. Experiments were absolutely necessary. The industry was now in a very favourable position; but they could not afford to rest upon their oars, and say there was no prospect of improving the existing apparatus. Their opponents had some clever men among them; and therefore no matter to what pitch they had got the production of gas, they must continue to move forward. The works they had gone over that day were very nicely arranged; and those who were responsible for the carrying on of them would have plenty to occupy their attention, for it was a growing district. The members were greatly indebted to the Company and the officials for the courtesy extended to them; and he was only sorry that Mr. Trewby had to be away. The vote was seconded by Mr. W. J. Liberty, who said it was a very great thing to see gas going ahead as was the case at these works.

Mr. Gale, in acknowledging the vote (which was carried by acclamation), pointed out that the Company had a large area, and very few houses on portions of it. The price of gas was certainly not high, when one considered the area and the number of consumers. He was, for three reasons, pleased to say they had electricity at Finchley. The first reason was that it created competition, which was a good thing; secondly, people could not say that gas had a monopoly; and, thirdly, a comparison of the lights was a very good advertisement for gas. The saying that "Comparisons are odious" must have originated with an electrician. He was sure that Mr. Trewby would be pleased to see the members of the Association at any other time they might like to visit the works. The place was at present somewhat in a state of chaos; but if they returned in (say) a couple of years, they would find everything in "apple-pie" order.

Society of Engineers.

The first ordinary meeting of the Society for the present year was held on Monday evening, Feb. 3, at the Royal United Service Institution, Whitehall. Mr. Maurice Wilson, the President for 1906, occupied the chair at the opening of the proceedings, and presented the premiums awarded for papers read during the year; among them being a premium of books to Dr. David Sommerville, for his paper on "The Chemistry and Bacteriology of Potable Waters." The thanks of the Society were accorded to several gentlemen, among them being Mr. Perry F. Nursey, the Secretary, for papers presented by them. Mr. Wilson then introduced the President for the current year, Mr. Richard St. George Moore, and vacated the chair, receiving a hearty and unanimous vote of thanks for his services. The President then proceeded to deliver his Inaugural Address, which was a thoughtful consideration of the *status* of professional or consultant engineers, with suggestions for its improvement. He divided under two heads the points he suggested as being worthy of attention—viz., (1) Those which apply to the profession and to the public, and control them equally, therefore requiring legislation; and (2) those which apply only to the internal regulation of the profession. The most important point raised under the first head was: Would it be wise and advisable for engineers to have a legal standard of qualification before they can be entrusted with the expenditure of public moneys or with works where the public safety is concerned? In arguing in favour of some form of control, the President pointed out that in both France and Germany the control of the expenditure and the public safety is only entrusted to engineers of very specific acquirements. The address was listened to with marked attention by a large and appreciative audience; and at its close a hearty vote of thanks was accorded to the President.

The Midland Junior Gas Engineering Association will hold their second annual general meeting on Saturday, the 2nd prox. After the presentation of the Council's report and balance-sheet, the election of officers for next session, and the filling of vacancies on the Council, Mr. W. Wastell will read a paper entitled "Gas-Works Statistics."

YORKSHIRE JUNIOR GAS ASSOCIATION.

Visit to Glass Houghton and Castleford Collieries.

A large number of the members of the Association assembled on Saturday at Pontefract, to visit the pits and surface works of the Glass Houghton and Castleford Collieries, Limited. Several of the West Riding gas engineers accompanied them, and the party was joined at the station by the Mayor (Alderman Granidge), Councillor Stuart Lowden, Mr. J. E. Pickard, the Borough Surveyor, and Mr. S. B. Bagley, of Messrs. Bagley and Co., bottle manufacturers, of Knottingley, the largest local customers of the colliery. The visitors were conveyed to the neighbourhood of the pits in special tramcars which were in readiness; and no labour and forethought had been spared to ensure the general comfort and instruction of the members. The visit had been secured by the good offices of Mr. L. V. Whitaker, Manager of the Pontefract Gas Company, who is one of the members of the Association; and, in conjunction with the officials of the colliery, he carried out all the arrangements.

After having made the necessary alterations to their dress and been provided with lamps, the visitors assembled in the workshops, where under one roof, in a building 162 feet by 40 feet, the carpenters, fitters, blacksmiths, &c., do their work. Here Mr. John Parkin, the General Manager, bade the members a hearty welcome, briefly sketched the afternoon's arrangements, and then handed the party over to the guidance of Mr. Charles Parkin, Mr. B. Burton, Mr. J. O. Cooper, and other members of his staff. The various local visitors joined the party in loyally doing the full circuit of the underground workings marked out to be visited.

The colliery is on the extreme east of the West Riding coalfield as at present worked, and is therefore of considerable depth. Three pits have been sunk to the Haigh Moor, the Silkstone, and the Beeston seams—these being respectively 347, 550, and 637 yards deep; while a fourth is being sunk from the Silkstone to the Beeston seam. The 550 yards pit was the one descended, as it is at present the most important one—yielding from 2000 to 2300 tons of coal per day; and as the seam is a 5-feet one, the workings very dry, and the roads free from dust, it presented the minimum of inconvenience to the visitors. The seam nearest the surface is now nearly exhausted, and yields but about 200 tons of coal per day; while the workings are more than a mile-and-a-half from the bottom of the shaft. The lowest seam is not yet fully opened out; but when the necessary works in connection with it are completed, it is expected to give a daily output of another 2000 tons. The cages have each four decks, each deck accommodating three corves holding 11 to 12 cwt. each. Both at the surface and at the bottom of the pit, the corves are put on and taken from the cages at two levels simultaneously.

As few if any of the members present were unacquainted with the ordinary details of coal mining, the great attraction was recognized to be the exceptionally complete installation of labour-saving devices; and as the management had, with great kindness, arranged that everything should be shown in operation, even having a number of hewers at work and a pony attached to some corves, close attention was paid to the details, and especially the mechanical devices. In the pit visited all the underground power is compressed air, with the exception of one section, where the haulage is operated by electricity. Two 16-inch cylinder engines, worked by compressed air, are used for hauling the corves by endless rope along the main roads. The coal is conveyed from the working faces along band conveyors, which feed on to plate-belt conveyors, and these in their turn discharge into the corves. This pit, though but a very recent one, and with no distant workings, has now 660 yards face of these conveyors. The conveyors were not only seen in movement, but actually carrying coal just hewn. The members were, of course, familiar with such conveyors in gas-works; but their utilization under such novel and severe conditions (of which this was an early installation) was well worth a special visit. Much interest was aroused in the ease with which huge pieces of coal were transported; and the great advantages of the band conveyor in speed and in the amount it can handle in a given time, were plainly seen.

Returning to the surface, the sources of the power production were visited. Steam is supplied by sixteen Lancashire boilers, 30 feet long. Eleven are new, and have a working pressure of 120 lbs. per square inch; while the other five work at 60 lbs. pressure. All their feed-water is superheated by the exhaust steam from the various engines. The winding-engines have 44-inch cylinders and 7-feet stroke; while the winding-drum is 20 feet in diameter. The air-compressing plant consists of two sets of two-stage compressors. The low-pressure air cylinder is 30 inches in diameter, from which, after cooling, the air is delivered to a high-pressure cylinder of 22 inches diameter, working at 60 lbs. per square inch. Room is left for doubling this plant soon. These compressors work continuously night and day; doing the underground haulage in the two seams now worked, and driving the conveyors during the day shift and the coal-cutters during the night shift. Similarly, the electric plant runs continuously, one 50-kilowatt dynamo driving one section of the underground haulage in the silkstone seam during the day shift, and the coal-cutting in the top seam during the night shift. Another dynamo supplies the electric lighting. As several of the members are connected with works where compressed air is used for West's chargers, and as most of those present had seen the system in use in gas-works, this compressing plant was examined with something of professional eagerness and keenness.

The ventilation is produced by a self-contained "Waddel" fan, 25 feet in diameter, capable of discharging 300,000 cubic feet of air per minute. The construction of this fan was carefully explained; and the advantages of the unusual incidence of its centre of gravity were pointed out. A new "Walker" fan, of equal capacity, was in course of erection, and was thus open to more easy inspection. The electric power and lighting dynamos, air-compressors, and gas-engines for driving the second fan are all under one roof, and so need but one attendant on each shift. There are 30 coke-ovens, very much after the old beehive type, with the necessary crushing and elevating plant. The screening-plant at the head of the silkstone seam pit was seen in full operation; and the whole process, from the arrival of the coal at the mouth of the shaft to its various destinations in waggons, &c., was duly followed. It is claimed that this plant is one of the most complete and efficient in the country; and being capable of dealing with from 2500 to 3000 tons per day, it is well ahead of any claims that may be made on it. The output of the collieries is approximately 600,000 tons per annum; and a total of about 1700 persons find employment above and below ground.

On their return to Pontefract, the members were entertained at dinner at the Queen's Hotel by the proprietors of the colliery. The Corporation and other official visitors were present, and the Mayor occupied the chair. After the usual loyal toasts had been honoured, Mr. John Parkin, the General Manager, proposed "The Gas Industry and its Associations." After references to Murdoch and his experiences and work, he dealt with the importance of the gas industry as regards the capital invested in it, and showed how important a share of the total coal output of the country it utilized. He thanked the members for their visit, and assured them of the pleasure it had given the management to arrange for their coming. He bore testimony to the willing co-operation of his assistants; and expressed the hope that all present had enjoyed and profited by their visit. Mr. J. W. Turner, the Engineer and Manager of the Mirfield Gas Company, responded. Mr. W. Cranfield proposed "Success to the Glass Houghton and Castleford Collieries, Limited," and voiced the thanks of the members for the benefits, intellectual and material, which had been so generously provided for them. Mr. B. Burton responded on behalf of the Company. Mr. H. Butterfield, the Junior Vice-President, proposed "The Mayor and Corporation of Pontefract." The genial Mayor has had a lifelong interest in gas companies, on the directorate of several of which he has served; and in the Pontefract Gas Company he is just now peculiarly concerned, inasmuch as he is both a large shareholder and the official head of the Corporation, who, as our readers are aware, have lately obtained powers for the purchase of the Company's undertaking. His speech in reply to the toast of his health was racy, and abounded in reminiscences of his experiences in gas matters; and it most suitably wound up an afternoon and evening that will long linger in the memories of those who were present.

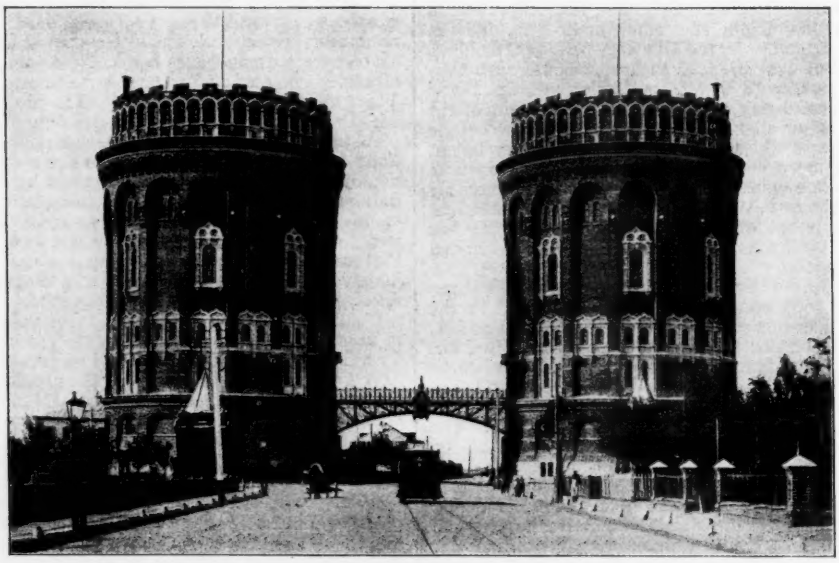
Society of British Gas Industries.

The arrangements for the annual general meeting of this Society have been made. The meeting place will be the Holborn Restaurant; and Wednesday, Feb. 27, the date. There will be a business gathering of members at 3.30; and at 5 o'clock the President (Mr. Dugald Clerk) will deliver his presidential address. The topic he has chosen is "Some Possible Improvements in British Patent Law;" and in view of the proposed amendments that the President of the Board of Trade has in hand for the consideration of Parliament this session, Mr. Dugald Clerk's address will come very opportunely. Perhaps Mr. Lloyd-George might do worse than wait till after the meeting before divulging the nature of his amendments, as if there is anyone able to give him a lead in connection with patent law, that one is Mr. Dugald Clerk. In the commercial life in which the members of the Society move, the Prevention of Corruption Act, 1906, is of great importance, for the measure is as much to prevent unfair advantage being taken of, or injury done to, the manufacturer and contractor by unscrupulous persons, as it is to guard officials and others from insults and temptations, and to prevent their corruption. Therefore the exposition of the Act that Mr. C. E. Brackenbury, Barrister-at-Law, is to give will furnish an excellent second part to the meeting. There will be an informal dinner of members and friends in the evening.

The Proposed Engineering and Machinery Exhibition.—We learn from the prospectus of this exhibition, which is being organized by Messrs. Smith and Bridges, to be held at Olympia from Sept. 19 to Oct. 19 next, that sections will be devoted to gas, steam, and oil engines, water-works engineering, and chemical plant. In the list of patrons of the exhibition are the names of Mr. Charles Hunt and Mr. W. B. Bryan, the Presidents respectively of the Institution of Gas Engineers and the Junior Institution of Engineers. As already mentioned, the Secretary of these Institutions (Mr. Walter T. Dunn) is upon the Advisory Committee, other members of which are Mr. Dugald Clerk, Mr. J. W. Helps, and Mr. D. Irving. The President is Sir Alexander B. W. Kennedy, F.R.S., the President of the Institution of Civil Engineers.

TWIN WATER-TOWERS AT MOSCOW.

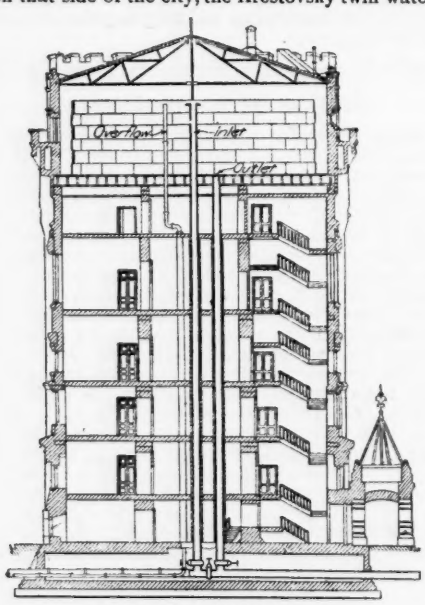
Moscow, the ancient capital of Russia, has now a population of about a million; and its water-works have a capacity of some 20 gallons per head. The works are owned by the Municipality, who sell water to consumers at a uniform rate of about 10d. per 1000 gallons. There are two separate water-works systems, both containing many interesting features, which are described in a report by Mr. N. P. Simin, formerly Chief Engineer of the Water Department. The following notes, extracted from the report, appeared in a recent number of "Engineering Record."



The Krestovsky Twin-Towers of the Moscow Water-Works.

The central part of the city receives ground water from Mitishy, while the surrounding districts are supplied with filtered river water, taken from the Moscow River at Roublevo. Both sources are situated about 10 miles from the city. Each of the two distributing systems receives its water from elevated reservoirs placed at the entrance of the mains supplying the city. The 36-inch main for river water, with a second parallel 36-inch main now being laid, reaches the city on its southern side, and there discharges into a reservoir placed at the highest point of the Sparrow Hills.

The two ground-water mains, 30 inches and 24 inches in diameter respectively, enter the city on the north. There being no hills on that side of the city, the Krestovsky twin water-towers



Section of One Water-Tower.

were built to support the tanks which serve as reservoirs. These are placed at the same level as the Sparrow Hills reservoir, so that the two water supplies may be connected if necessary. The Mitishy ground water supply delivers into the twin towers about 10 million gallons per day. The water is drawn from sixteen driven wells, 20 inches diameter; special centrifugal pumps being used for the purpose. These pumps are sunk 50 feet deep in each of the 20-inch well casings, and are driven by three-phase motors at the ground level, connected directly with the vertical shaft of the pumps. The water is pumped first to the Alexeievsky distributing reservoir, having a capacity of 3½ million gallons, and then to the elevated tanks in the twin towers.

The tank of each tower has a capacity of 500,000 gallons; being 60 feet in diameter and 20 feet deep. The top is 116 feet above the surface of the ground, which ensures a pressure in the pipe system nowhere less than about 30 lbs. The total height of the towers is 129 ft. 6 in. They are of a cylindrical shape 82 feet in diameter, built of brick masonry laid in portland cement. The foundations are 14 feet deep, and rest on sand. Each consists of a layer of concrete 2 ft. 6 in. thick, over which 11 ft. 6 in of brick masonry in circular and radial walls is placed. The bottom plate of each tank is $\frac{5}{8}$ inch thick, and the cylindrical walls are $\frac{1}{4}$ inch and $\frac{1}{2}$ inch thick. The weight of each tank is 80 tons; that of the water it contains is 2000 tons; and the total weight of each tower, with the reservoir filled with water, equals 14,000 tons. The two towers are identical in construction, and symmetrical; they are connected by an iron bridge at the height of the third storey. There are six floors below the bottom of the tank, as shown in the accompanying illustration. All the apartments in the towers are utilized for different purposes of the water-works administration. Each tower has its central steam heating-system. The total cost of construction of both towers, including the tanks and piping, was about £90,000.

When the towers were ready for use, two very interesting facts were observed. In the first place, expansion cracks showed themselves in the walls of the towers as soon as the heating of the interior rooms began in winter. These cracks appeared in both towers quite symmetrically in places where the furnace of the central heating system passed near the walls. An accurate examination showed that there was no change in the positions of the foundations. Precise registrations of the periodical widening and contraction of the cracks were made by special instruments during two years; and they showed that the cracks opened to the maximum of 1 inch in the coldest days of winter, when the difference between the inside and outside temperatures reached its maximum. In summer, when the heating system was not used, the cracks closed almost entirely. Investigation led to the conclusion that they were inevitable.

The circular wall of each tower is about 225 feet in circumference, and from 3 to 6 feet thick. The difference between the inside and the outside temperatures in winter is about 40° C. (104° Fahr.). This tends to make the outside of the wall shorter and the inside longer by about 1 inch. This change of length would correspond to a stress of (say) 180 lbs. per square inch, which exceeds the strength of brick masonry. The radial walls in the towers have the effect of increasing the thermic strains of the outside walls. The appearance of thermic cracks in the walls could have been avoided only by the use of expansion joints.

The other matter deserving attention was an unusual accident to the pipe system in one of the towers. The pipe supplying the tank enters it at the top, while the discharge-pipe is led off from the bottom. At a time when the reservoir remained about half filled for several hours, an eddy formed over the outlet-pipe, into which air was thus drawn. The air accumulated behind a half-closed valve on the 24-inch main leading to the distributing system. When this valve was fully opened, the liberation of the air caused a severe water-hammer shock, which ejected from the pipe a stream of water with sufficient force to break through the roof of the tower, the air pocket acting in much the same way as do those in air lift-pumps.

REGISTER OF PATENTS.

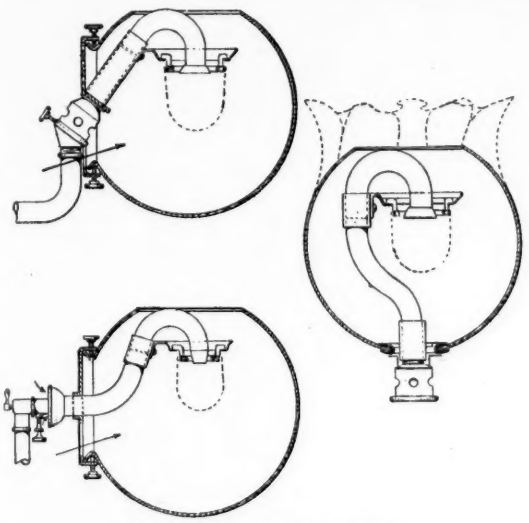
Inverted-Mantle Incandescent Gas-Lamps.

STEINICKE, G., of Berlin.

No. 1848; Jan. 24, 1906.

This inventor uses a detachable mixing-tube which ascends within the globe, and has, at its upper end, a downwardly bent portion to which the mantle is fitted. Three forms of the lamp are shown.

In the first form, the gas enters laterally, and to the inlet pipe is fitted an inclined nozzle having an adjusting screw. The lateral aperture in the globe is provided with a metal disc (preferably perforated), leaving the lower part of the lateral aperture open for the passage of air. The disc has an inclined downwardly directed edge or flange provided with a circular aperture into which is fixed a tubular socket,



Steinicke's Inverted Mantle Lamps

which serves for the reception of the upwardly directed mixing-tube, and thus allows of mounting the globe and fittings on the mixing-tube. Into the upper end of the socket is inserted one end of a bent pipe which forms a continuation of the mixing-tube, and to which the mantle and support are attached.

In the second form, a horizontally directed pipe is connected to the gas supply-pipe and passed through a lateral aperture in the globe. This lateral aperture is closed by a metal plate having at its lower part an aperture for the entrance of air. The regulation of the gas supply to the nozzle is made by the tap or screw at the side.

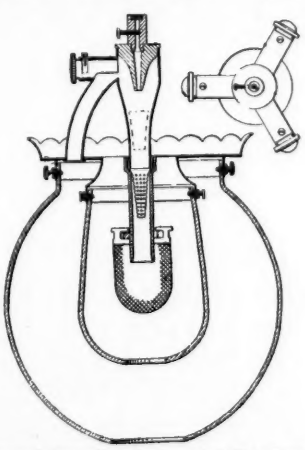
In the third construction, the gas supply is from the bottom through a nozzle and pipe coupling. To the latter is connected a downwardly bent pipe and support for the mantle.

Inverted Incandescent Gas-Lamps.

PRICE, C. W., of Holloway, and SPREADBURY, E. L., of Kettering.

No. 2369; Jan. 30, 1906.

According to this invention, the air which mixes with the gas in the bunsen burner is heated by being passed through tubes which are heated by the combustion in the mantle. The supply of gas to the burner is regulated independently of the ordinary tap; and the air supply is also capable of being regulated independently of the gas



Price and Spreadbury's Inverted Gas-Burners.

supply. The burner can thus be adjusted so as to obtain the required pressure of gas and air notwithstanding that it is used with different gas pressures. To improve the admixture of the gas and air in the mixing-tube of the burner and reduce liability to back-firing, the gas and air are caused to pass through contracted passages on their way to the mantle; the arrangement being such that the gas and air are afterwards allowed to expand by fitting in the mixing-tube one or more hollow truncated cones, the smaller end of each being downwardly directed.

In the construction of lamp shown, the gas inlet is controlled by a set-screw extending into the gas-passage. The mixing-tube projects through a central opening in a cover or plate that carries a depending glass globe having a suitable air inlet and adapted to enclose the mantle. The globe is so supported that its upper edge makes a practically tight joint with the cover or plate. Extending upwardly from the plate or cover are a number of air-tubes, which connect the space within the globe with the mixing-chamber of the burner near the gas-jet. These tubes (either parallel or decreasing in cross sectional area towards the upper ends) are inclined inwardly and connected to short horizontal tubes that lead to the mixing-chamber. They are fitted with hollow screwed plugs, each closed at its outer end and having a side aperture corresponding in size to the top of the inclined air-tube, so that, by turning the plug slightly, the supply of air can be regulated.

From the underside of the plate around the central aperture there depends a funnel-shape flange or tube of such size and extending far enough down to ensure that the products of combustion will pass up through it, around the mixing-tube of the burner, and pass out through the central opening in the cover or plate. This will also heat the inclined air-tubes, and facilitate the circulation of air from the globe through the air-tubes into the mixing-tube of the burner, and so increase the proportion of air to gas flowing through the mixing-tube. With such an arrangement "the air will be highly heated before mixing with the gas, and the mixture will be extremely hot by the time it reaches the mantle."

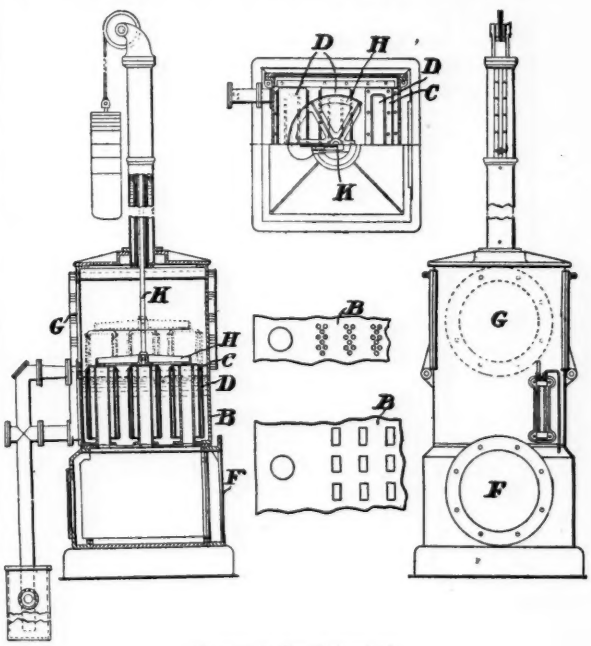
Extracting Tarry Matter from Gases.

CLAPHAM, S. B. & T. A., of Keighley.

No. 3809; Feb. 16, 1906.

This apparatus is of the kind wherein perforated plates are employed for the gases to pass through and impinge upon; and the invention consists in an "improved formation," so that, "without increasing the cost of production, the efficiency or capacity is enhanced."

Heretofore in this class of apparatus, the perforated plates have been arranged upon their bearings either in the form of an octagon or square in horizontal cross section; and the several series of plates have thus been somewhat concentric with the opening through which the gases were admitted to pass through them. The apparatus has thus had to be of considerable size compared with the volume of gas to be treated. To obviate this, the present patentees propose to mount the perforated plates B in their proper relative positions upon bearings C, which retain them in the form of rectangular or oblong bells D.



Clapham's Tar-Extractor.

These rectangular bells are mounted in the positions shown—to carry out what may be styled a side-by-side arrangement of them. It enables a larger number of bells to be mounted in a given space than when other methods of construction are followed. It is also possible to keep the areas of inlets and outlets F G to and from the perforated bells in "more efficient proportion with the bell area." The perforations in the plates are circular in one plate and oblong in the adjoining plate; the circular perforations being made in the plates through which the gas first passes.

To suspend the bells, a circular bracket H is secured to the end of the rod K, on the other end of which is a chain passing over a pulley (supported by a column with a water-locked joint) to carry a counterbalancing weight, so that the bells are enabled to automatically rise and fall within the chamber containing them, in order to vary the area of the perforations they present for the passage of the gas, proportionate to the quantity of gas entering and rising through the passages

within the bells. In this way, the impinging velocity of the gas is kept constant.

The bells are shown in their lowest position by full lines, while their raised position is shown in broken lines; and their height or position within the chamber R is indicated by a pointer carried by the rod K and sliding within a groove in the column above the vessel.

Charging and Discharging Gas-Retorts.

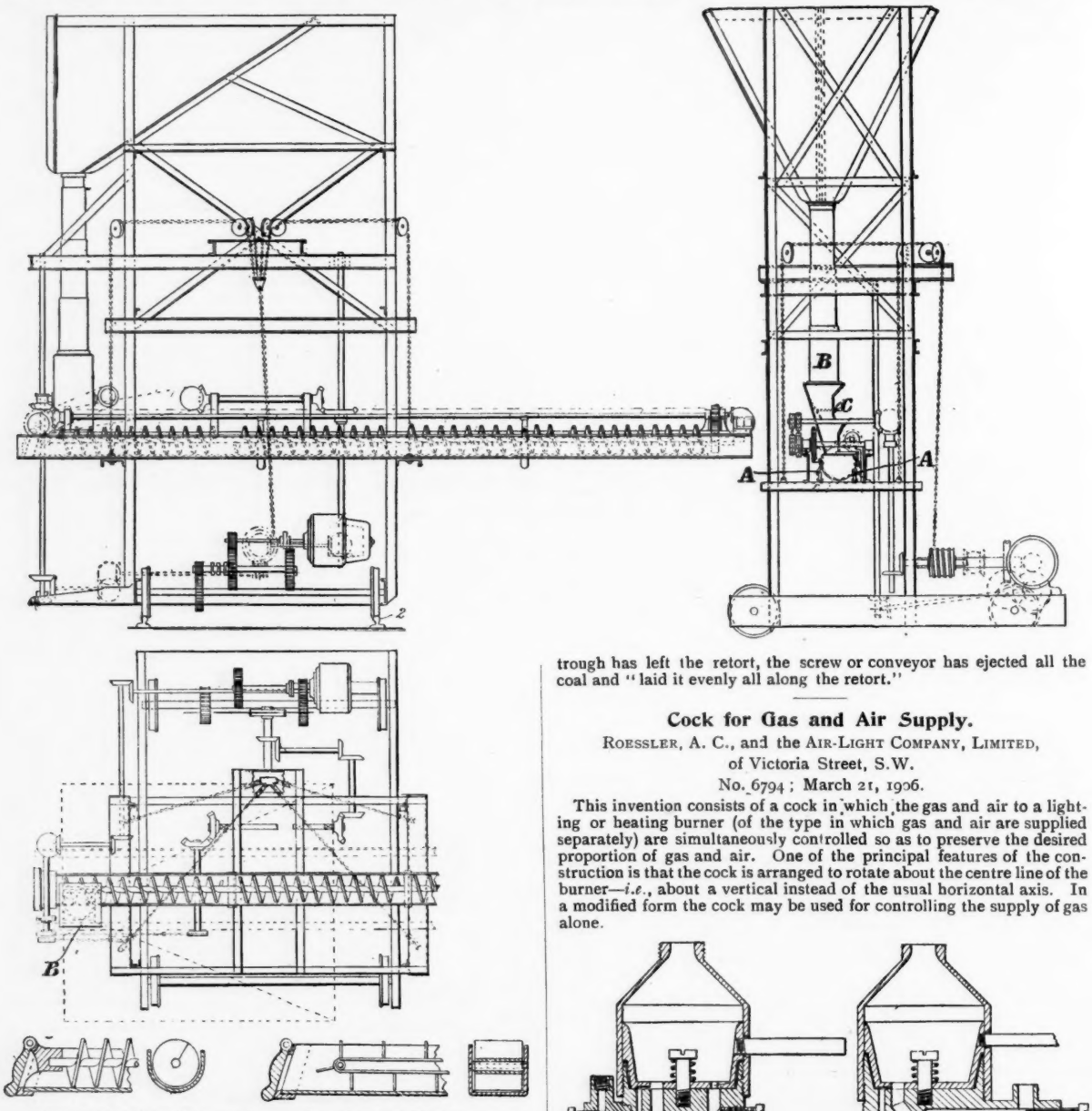
COLE, W. L., of Bow, and LUDBROOK, S.W., of Stepney, E.

No. 6204; March 14, 1906.

This apparatus for discharging and charging gas-retorts consists of a trough, combined with a screw or chain plate conveyor inside the trough, a hinged pusher-head on one end of the trough, telescopic tubes for conveying coal from a hopper to the trough, and means for operating the trough and conveyor—the operation being that the coal is supplied to the trough while it is being inserted into the retort for its head to eject the coke from the retort; and on the return of the trough, and has the lower part formed so that its bottom edge rests on the retort while pushing out the coke.

Suitable mechanism is provided to move the apparatus along the retort-house and to raise and lower the trough and move it for ejecting the coke and recharging the retorts.

When the trough and screw or plate conveyor have been adjusted as to position to discharge a retort, the trough is pushed forward by chain or other gearing, and at the same time the coal supply from the hopper is established. During the progress of the trough through the retort, the coal is being supplied to the trough in proper quantity, and the pusher-head is ejecting the coke from the other side of the retort; so that by the time the trough has completed its movement and ejected the coke, the trough has had the proper supply of coal introduced all along its length. The coal supply is then shut off. The mechanism is now operated to withdraw the trough, screw, and pusher, and at the same time the archimedean screw or plate conveyor is set in motion. This passes the coal out of the trough at the pusher-head—canting the pusher-head in so doing, so as to allow egress of the coal, and leaves the coal in the retort all along its length as the trough and screw or conveyor recedes. Thus, by the time the trough has left the retort, the screw or conveyor has ejected all the coal and "laid it evenly all along the retort."



Cole and Ludbrook's Apparatus for Charging and Discharging Gas-Retorts.

the conveyor is operated to eject the coal from the trough and lay it in the retort. It is of the kind described in C. W. Lyon's patent (No. 3413 of 1891), the specification of which was abstracted and illustrated in the "JOURNAL," Vol. LIX., pp. 249-50.

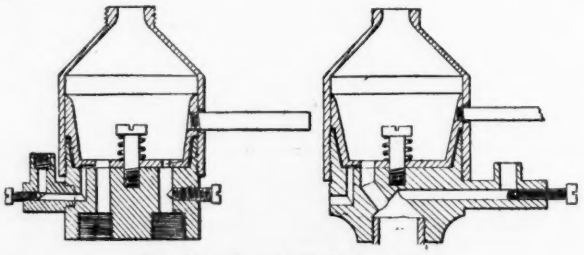
The ejector and charger consists of a long trough containing an archimedean screw, or else chain wheels and chains carrying scraper plates—the trough carrying at one end a pivoted pusher-head, which is freely suspended. The front end of the trough is held in a framework or collar A, in connection, by telescoping tubes B, with a coal-hopper at the upper part of the apparatus. The outlet or inlet of the telescoping tubes is controlled or not by valves C. The trough is connected to any suitable gear to enable it to be raised and lowered; and the archimedean screw or plate conveyor is connected to a motor, either direct or through gear. The hinged pusher-head is of curved shape,

Cock for Gas and Air Supply.

ROESSLER, A. C., and the AIR-LIGHT COMPANY, LIMITED, of Victoria Street, S.W.

No. 6794; March 21, 1906.

This invention consists of a cock in which the gas and air to a lighting or heating burner (of the type in which gas and air are supplied separately) are simultaneously controlled so as to preserve the desired proportion of gas and air. One of the principal features of the construction is that the cock is arranged to rotate about the centre line of the burner—*i.e.*, about a vertical instead of the usual horizontal axis. In a modified form the cock may be used for controlling the supply of gas alone.



Roessler's Gas and Air Mixing Cocks.

The valve (as shown) consists of a dished shell, preferably slightly coned and adapted to work in a seating provided with openings communicating with the gas and air inlets to the valve body. These inlets are provided with screws for adjusting the proportions of gas and air; a bye-pass also leads to the valve seat, and may be arranged to be kept continually burning or to be extinguished at such times as the main burners are alight. The valve preferably pivots about a screw, around which there is provided a spring which holds the valve resiliently to its seat. A cover is also provided over the valve (adapted to be screwed on to the valve body at one end and to the burner mixing-tube at the other) and furnished with a circumferential slot, through which passes a lever by which the valve is operated. Ports in the valve are

arranged to control the gas and air passages having their outlet at the valve face.

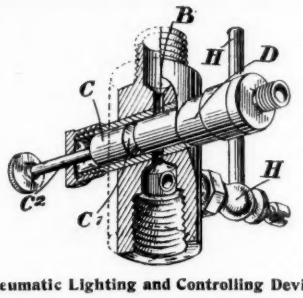
In the modification shown, for use in ordinary gas-lamps when no separate air conduit is employed, the air inlet to the valve body is dispensed with, and there are adjusting screws for altering the proportions. This form of cock is said to be "particularly useful in street lighting, as the horizontal motion of the lever and the arrangement of the cock barrel to rotate about the central line of the burner tend to reduce the vibration in lighting and extinguishing the burner, whereby this form of gas-cock is of particular advantage in connection with incandescent mantles." Further, the lever can be easily found in the dark—a matter of considerable importance in ordinary street lighting effected by a long pole.

Controlling Conduits for Gas or other Fluid.

EDWARDS, A. N., and the PNEUMATIC GAS LIGHTING COMPANY, LIMITED, Farringdon Street, E.C.

No. 23,759; Oct. 25, 1906.

This invention relates to apparatus for controlling a conduit for gas or other fluid by a piston-valve working in a chamber at right angles to the conduit which it controls, and provided with an extension whereby the position of the piston-valve may be locally controlled. This extension is in the form of a rod passing out through an opening at the end of the piston-chamber; and, the patentees remark, if the rod fits loosely in the opening, "the leakage of air past the extension will facilitate the movement of the piston, as there will be but little com-



Pneumatic Lighting and Controlling Device.

pression of the air in front of it as it moves towards the end of the chamber."

The main portion of the fitting is provided with a central bore B (through which the gas passes) controlled by a piston-valve C having in it a groove C^1 and working in a chamber D placed crosswise of the main portion. At one end of the chamber D is a screwed nipple adapted to receive the supply pipe from the source of pressure or suction, and at the other end is a screw cap having a central opening through which passes an extension of the piston. This extension C^2 is furnished with a head so that the piston may be easily moved by the finger.

The fitting is shown in a position which would be suitable for its use with a burner of the ordinary upright type, in which case the gas supply would come from the bottom and pass out at the top through the bore of a screwed nipple to which any burner can be applied. The lower portion of the main body is internally threaded to receive the nipple of the gas supply-pipe; and a bye-pass H is provided having a passage which opens into the interior of the body. Below this opening is a ledge, flange, or collar J, the purpose of which is to prevent any accidental obstruction of the outlet to the bye-pass H by means of the nipple which screws into the fitting.

The supply of gas through the passage B is cut off by the piston C when it is in the position shown; but when it is moved, by suction or pressure, so that the groove C^1 in the piston coincides with the bore B, gas flows through freely.

The local control of the piston by the extension C^2 admits of the piston being easily moved should it stick. Moreover, the employment of a removable screw cap with the extension of the piston passing through it enables the piston to be very readily withdrawn for cleaning purposes. Again, supposing a number of the fittings are employed (say) on a large chandelier, all controlled from one pneumatic apparatus, any individual burners may, by means of the local control device, be readily shut off. On the other hand, where all the burners have been shut off by pneumatic action, any individual light can be turned on and off again locally, without necessitating the actuating of the push or pneumatic switch, probably at some distance away. Moreover, the local control is said to be advantageous in that it enables the gas to be turned up or down locally, quite independently of the switch or push.

Curious Carbon Monoxide Poisoning Case.—Giving evidence at the inquest on a woman named Jordan (aged 43 years), who lived at Rockferry, near Birkenhead, Dr. Noble said he and his partner had attended deceased since June last, when her symptoms were a greyish-coloured skin, hurried breathing, palpitation, general weakness, loss of memory, and inflammation of the nerves. At first he was nonplussed; but eventually he concluded that she was suffering from carbon monoxide poisoning. She used a gas cooking-stove supplied by the Corporation, and had complained of an escape of gas. Witness found an odour of gas in the kitchen. Deceased became worse, and died from paralysis of the heart and respiratory organs, set up by carbon monoxide poisoning. He believed this had been caused by inhalation of the gas. Since this case, he had attended domestics and others suffering in the same manner. The reason was the mixing of carburetted water gas with the coal gas. There was no danger arising from the fumes of the burnt gas. A verdict was returned in accordance with the medical testimony; but the Jury found that it was impossible to state what was the cause of the poisoning.

PARLIAMENTARY INTELLIGENCE.

OPENING OF THE SESSION.

The King's Speech.

The second session of the Second Parliament of the present King was opened last Tuesday by his Majesty (who was accompanied by the Queen), with the usual formalities. The speech from the Throne contained a reference to only one matter in which our readers are at all interested, and that was the announcement that the Legislature would be invited to consider proposals for the amendment of the patent laws and for improving the law relating to the valuation of property in England and Wales. At a subsequent stage of the proceedings, Mr. Lloyd-George and Mr. John Burns, the Presidents of the Board of Trade and the Local Government Board, gave notice of their intention to bring in, on an early day, Bills dealing with these subjects.

Allocation of Private Bills.

At the meeting of the House of Commons last Wednesday, the Chairman of Ways and Means (Mr. A. Emmott) reported that, in accordance with the Standing Orders, he had conferred with the Chairman of Committees of the House of Lords (the Earl of Onslow) to determine in which House the respective Private Bills should be first considered; and they had decided that the following should originate in the Upper House:—

Ashton-under-Lyne, Stalybridge, and Dukinfield (District) Water-Works Bill, Birkenhead Corporation Water Bill, Birmingham Corporation Water Bill, Broadstairs and St. Peter's Urban District Water Bill, Colne Valley Water Bill, Coventry Corporation Water Bill, Devonport Corporation Bill, Great Yarmouth Water-Works and Lowestoft Water and Gas Bill, Heywood and Middleton Water Board Bill, Newquay and District Water Bill, Ogmore and Garw Urban District Council (Water Supply, &c.) Bill, Portishead District Water Bill, St. Neots Urban District Council Bill, Selsey Water and Gas Bill, Sheffield Corporation Bill, South Lincolnshire Water Bill, Southend Water Bill, Southport, Birkdale, and West Lancashire Water Board Bill, Tees Valley Water (Consolidation) Bill, Tynemouth Corporation (Water) Bill, Wisbech Water Bill.

The following Bills will therefore originate in the Commons:—

Annfield Plain and District Gas Bill, Basingstoke Gas Bill, Boston Spa Gas Bill, Brighouse Corporation Bill, Brockenhurst Gas Bill, Bude Gas Bill, Falmouth Gas Bill, Gas Companies (Removal of Sulphur Restrictions) Bill, Grays and Tilbury Gas Bill, Keswick Urban District Council (Water) Bill, King's Norton and Northfield Urban District Council Bill, Kingston-upon-Hull Corporation Bill, Leeds Corporation Bill, Llandrindod Wells Gas Bill, Maidstone Gas Bill, Metropolitan Water Board (Charges, &c.) Bill, Metropolitan Water Board (Various Powers) Bill, Mitcham and Wimbledon District Gas Bill, Penrith Urban District Council Bill, Pontypridd Urban District Council Bill, Shanklin Gas Bill, Worthing Gas Bill.

With the exception of the Boston Spa Gas Bill, in respect of which non-compliance with Standing Orders has been reported, and the Pontypridd Urban District Council Bill, all the Commons Bills have been read the first time.

Petitions against Private Bills.

In accordance with the Commons Standing Order No. 128, which requires petitions against Private Bills to be deposited on or before the 12th of February, the following (among other) petitions have been presented against the Bills named:—

Administrative County of London and District Electric Power Bill, by the Hampton Court and West Kent Gas Companies and the Metropolitan Water Board.

Annfield Plain and District Gas Bill, by the Annfield Plain Urban District Council.

Birkenhead Corporation Water Bill, by the Cheshire County Council.

Boston Spa Gas Bill, by the Bramham Gas Company and the Wetherby District Water Company.

Broadstairs and St. Peter's Urban District Water Bill, by Lord Greville.

Brockenhurst Gas Bill, by the Southampton County Council.

Coventry Corporation Water Bill, by the North Warwickshire Water Company.

Falmouth Gas Bill, by the Falmouth Corporation.

Grays and Tilbury Gas Bill, by the Grays Thurrock Urban District Council and the Orsett Rural District Council.

King's Norton and Northfield Urban District Council Bill, by the Birmingham Corporation and the Worcestershire County Council.

Kingston-upon-Hull Corporation Bill, by the East Hull Gas Company and the Sculcoates Rural District Council.

Leeds Corporation Bill, by the Selby Urban District Council, the York Corporation, and the York Water Company.

Llandrindod Wells Gas Bill, by the Llandrindod Wells Electric Light and Power Company, Limited.

London County Council (Electric Supply) Bill, by the Brentford, Commercial, Crays, Croydon, Dartford, Gaslight and Coke, Hampton Court, South Metropolitan, and West Kent Gas Companies, the South Essex Water Company, and the Metropolitan Water Board.

London Electric Supply Bill, by the Brentford and West Kent Gas Companies and the Metropolitan Water Board.

London Port and Docks Bill, by the Brentford, Commercial, Dartford, Gaslight and Coke, and South Metropolitan Gas Companies.

Maidstone Gas Bill, by the Maidstone Corporation and the Sutton Valence Gas Company.
Metropolitan Water Board (Charges, &c.) Bill, by the Herts and Essex Water-Works Company, Limited.
Metropolitan Water Board (Various Powers) Bill, by the Barnet District, Herts and Essex, Leatherhead and District, Rickmansworth and Uxbridge Valley, South Essex, South-West Suburban, Sutton, and West Surrey Water Companies.
Mitcham and Wimbledon District Gas Bill, by the Croydon Rural District Council, the London and Surrey County Councils, and the Wandsworth and Wimbledon Corporations.
Shanklin Gas Bill, by the inhabitants in the urban district of Sandown and the parish of Newchurch, the Sandown Gas and Coke Company, the Sandown Urban District Council, and the Shanklin Urban District Council.
South Lincolnshire Water Bill, by the Bourne Urban District Council.
Southend Water Bill, by the Laindon and District Gaslight, Coke, and Water Company.
Tees Valley Water (Consolidation) Bill, by the Darlington Corporation.
Worthing Gas Bill, by the East Preston Rural District Council, the Goring and Durrington Parish Councils, and others.

Durham Coal-Owners' Association.

The following letter from Mr. Reginald Guthrie, the Secretary of the Durham Coal-Owners' Association, has been sent to the "JOURNAL" as well as to a large number of other London and Provincial papers: "My attention has been drawn to statements which have appeared in various quarters, that a combination of Durham coal-owners exists for the purpose of raising the price of coal to be supplied to the gas companies. Permit me to inform you that such a statement is absolutely opposed to the facts, and to express regret that such an unfortunate statement should have been made public. Whatever increased price has been, or may be, obtained for coal is entirely owing to increased demand arising from ordinary commercial considerations, and to no artificial cause whatever. In order to avoid the possibility of misunderstanding between the colliery-owners and contractors, I shall feel extremely obliged if you will be good enough to insert this communication in your next issue."

Electrical Calculations Extraordinary.

In a certain provincial town, a question arose as to the lighting of a church, and an estimate was submitted by the local Electric Light Company for the work, using metallic filament lamps (presumably "Tantalum"), with "Holophane" shades. The number of lights reckoned for was 54, and they were stated to be mostly of 180-candle power each. The estimated number of hours burning per annum was 154; the total reputed light was given as 8713 candles; and the cost, at 4½d. per unit, £14 7s. 3d. Now, a generous efficiency to attribute to the lamps named is 1·5 watts per candle-power-hour. This for 156 hours equals 2039 units, which, at the price stated, come to £38 4s. 7d., against the £14 7s. 3d. submitted. In looking at these figures, the question arises as to whether the candle power has not been greatly exaggerated, or the consumption of energy very much understated. It should be mentioned that the Company acknowledged that the candle power was given approximately; and one cannot but regard it as a very wide approximation to the truth. Credit must have been taken for trebling the amount of light by the addition of the shades, or else the candle power was taken at four different angles, added together, and a few ciphers tacked on for convenience in reckoning. But, whatever the process adopted, the calculations are, to say the least, extraordinary.

West Ham Gas Company.

In the report to be presented at the meeting on the 25th inst., the Directors state that the accounts for the half year to Dec. 31 show a balance in net revenue of £45,376, of which £16,443 was brought forward from preceding accounts. The net profit on the half-year's working is therefore £28,933; and the Directors recommend dividends of 5 per cent. per annum on the 5 per cent. preference stock (£4625), and 5½ per cent. per annum on the consolidated ordinary stock (£21,675), making together £26,300, and leaving a total of £19,076 to be carried forward. The demand for gas by prepayment meters is still well maintained; nearly 4500 additional installations on this system having been provided during the half year. The ordinary consumption has increased by 1·5 per cent. Since the last report, the Directors have felt justified in reducing the charge for gas from 2s. 10d. to 2s. 9d. per 1000 cubic feet—the reduction taking effect from Michaelmas last. Following the example of the larger gas companies in the Metropolis and elsewhere, the Directors have thought it right that the West Ham Company should assist in promoting a Bill to remove the restrictions in respect of sulphur compounds (other than sulphuretted hydrogen); and this Bill will be submitted for the approval of the proprietors at a special meeting to be held after the ordinary general meeting. The Stock Exchange quotations for the Company's debenture and ordinary stocks have now been extended to cover the issues made in April, 1906.

Cheaper Gas for Tunbridge Wells.—As from the commencement of the present quarter, the price of gas at Tunbridge Wells is to be reduced 2d. per 1000 cubic feet to all consumers, making the charge within the borough 2s. 8d. This concession, it is said, represents a loss of revenue to the Company of about the same amount that 2d. in the pound off the rates would mean to the Corporation. The street lighting will also benefit by the reduction, which will still further handicap the municipal electricity undertaking.

LEGAL INTELLIGENCE.

HIGH COURT OF JUSTICE—KING'S BENCH DIVISION.

Monday, Feb. 11.

(*Before Mr. Justice* RIDLEY *and a Common Jury.*)

Paterson v. South Metropolitan Gas Company.

This was an action brought by Mr. George Paterson for damages for alleged negligence.

Mr. LANGDON, K.C., and Mr. BENSON (instructed by Messrs. Weatherley and Co.) appeared for the plaintiff; Mr. HORACE AVORY, K.C., and Mr. ROSTRON (instructed by Messrs. Hicklin, Washington, and Co.) represented the defendants.

Mr. LANGDON said the plaintiff was a commercial traveller, who in December, 1905, was residing in Hearnville Road, Balham, having his own gas-meter fixed in the cellar. On the 8th of that month, as he was moving to Streatham, he gave notice to the defendants to disconnect and take away the meter. He turned off the gas, removed the fittings and his furniture, and left the key with his next-door neighbour, Mrs. Marriott. On the 11th, the meter not having been removed, he again gave notice to the Gas Company. Ultimately, on the 14th, two of their men obtained the key, went into the cellar, and disconnected the meter, but did not remove it. The next day, the meter not having arrived at Streatham, the plaintiff went to the premises, procured the key from Mrs. Marriott, who told him what the defendants' men had said to her, went down the cellar stairs, and struck a match. An explosion immediately followed, which knocked him down. He rushed upstairs, as soon as he came to himself, was taken into Mrs. Marriott's, his doctor was sent for, and one eye was found to be seriously injured. After being attended to he was taken home. He was under his own doctor's care for three weeks, and was then an out-patient at a hospital for some three months—the injury to his right eye being very serious, and resulting in a partial cataract, and permanent dilatation of the pupil. The defence was a denial of negligence, and a plea of contributory negligence on the part of the plaintiff; but he (Counsel) did not see how either defence could be established. The plaintiff had been for six years in the employment of one firm—his salary and commission amounting to about £200 a year; and he had just entered the service of another on better terms. They kept the position open for him for a few weeks, but had then to fill it up; and he was for some time out of a situation, and even now was not earning as much as he did before.

Mr. *Paterson* was called and gave evidence in great detail to the effect stated by Counsel. He said he struck the match to see where he was after descending the cellar steps, and the explosion occurred instantly. He knew nothing for a second or two; and then he found he was bleeding, and his face was burnt. He rushed up into the street, crying for help, and saying the place was on fire, as he smelt something burning.

Cross-examined: When he went to remove the meter, he took a saw with him to cut the pipe if necessary on the house side of the meter, as the Company's servants had directed his wife. Before he went into the house, Mrs. Marriott told him the meter had been disconnected and was all right—that the men had told her so. He only struck the match to see that he did not stumble against anything which had been left in the cellar; he had just got to the bottom of the stairs.

Mrs. *Mary Paterson*, wife of the plaintiff, spoke to a servant of defendants calling at Sternhold Avenue on Dec. 14, and telling her that if the person who went to fetch the meter found it was only disconnected on the Company's side, he could saw through the pipe to bring it away. Her husband wrapped up the saw in paper when he took it, and she brought it back from the house at Balham in the same condition. She was present when the doctor removed a piece of lead from her husband's eye. He was in bed three weeks.

Nothing material was elicited in cross-examination.

Mrs. *Marriott* gave evidence as to two of the Company's officials calling for the key of the next house on Dec. 14. They returned it shortly afterwards, and told her they had disconnected the gas-meter, and left it quite safe. The next day Mr. Paterson called, and she told him what the men had said. He went in, and the explosion occurred immediately.

Dr. *R. M. Johnson* spoke to the injuries the plaintiff had received. He said there were embedded in the eye several particles of red lead, of which he removed as many as he could at once, and then took plaintiff home in a cab. He attended him for some time, and then recommended him to see a specialist.

Dr. *Lionel Cargill* said he examined the plaintiff on the 30th of March last. He described in technical language the injuries to the right eye, the effect of which was that the sight was much impaired. There was a faint scar on the left eye; but this did not affect the sight. He had about one-sixth of his power of sight left. When he saw him last December, the plaintiff's condition was precisely the same, and would, in his opinion, remain so.

Cross-examined: In March the plaintiff complained of dazzling; and he (witness) advised him to try dark glasses, and get about, and see if he could attend to business.

This concluded the plaintiff's case.

Mr. AVORY, in opening the case for the defendants, said he should ask the Jury, when they had heard the evidence, to come to the conclusion that the explosion took place in the meter itself, and not in the cellar, and that the pipe belonging to the Company was properly disconnected and capped, so that no escape of gas could have taken place. If this were made out, he should ask his Lordship to direct that there was no negligence on the part of the defendants. If the work had been so negligently done that gas escaped from the service-pipe into the cellar, no doubt there would be negligence for which the defendants might be liable; but he should satisfy the Jury that it was physically impossible that the explosion could have arisen from any such cause. In the first place, the supply-pipe, after being disconnected, was tested

immediately after the explosion, and again some days later, and found to be perfectly secure. In the next place, the meter was blown to pieces by the explosion; but there was no damage to either the roof or the walls of the cellar. It was obvious, therefore, that what really happened was this: The plaintiff must have brought a naked light close to the orifice of the meter, which would still contain a certain quantity of gas mixed with air, and this exploded. The meter belonged to the plaintiff, and it was no part of the Company's duty to remove such a meter or empty it of any gas which might be left in it. If, as was said by the plaintiff, the whole cellar was full of gas, the dining-room and passage above must also have been full of it, and it must have been smelt by anyone entering the house. If, as appeared to be the case, the plaintiff was not certain whether or not the meter was disconnected on the house side—and he took a saw with him in case it should not be so—and struck a match to see, it would account for the whole thing.

Arthur Sheet, a gas-fitter in the defendants' service, gave evidence as to disconnecting the meter on Dec. 14; a man named Walker being with him. It was dark, so he lit a candle, went into the cellar, disconnected the inlet, and capped the service. He tried the cap with a light, and then cut the outlet pipe of the meter; leaving it standing on the shelf. He took the state of the meter, and noted it on the card, then went up to the scullery and disconnected the cooker. About a week after the accident, he went to the house again, with Mr. Millar, and there was no gas escaping then.

Cross-examined: He told Mrs. Marriott the place was safe. He meant that anyone could go into the cellar with a light without danger. When he went the first time, some gas would have escaped from the service-pipe if the cap had not been put on immediately. The gas left in the meter would gradually escape into the cellar; but he did not think there would be enough to cause an explosion. The tap was unscrewed, and the cap screwed on immediately. He did not apply a light to the meter before leaving; it was not the practice to do so.

Re-examined: When he capped the service-pipe, the quantity of gas escaping would be so small that he could not estimate it. It would all have disappeared from the cellar in an hour or two. The meter was left open at each end. When he went to the house, there were no signs on the walls of the cellar of any explosion having occurred.

Joseph Walker, a labourer who accompanied the last witness to disconnect the meter, corroborated his evidence.

William Edward Jones, another gas-fitter in defendants' employ, who was in the neighbourhood when the accident happened, spoke to going into the house, and finding smoke in the cellar, but detecting no smell of gas. The builder of the house was there; and he invited him to come down and see for himself. He struck a match in the cellar, and tested the service-pipe; and there was no escape of gas whatever. The meter was on the floor, 3 or 4 feet from the shelf on which it stood. It was a perfect wreck. There was no appearance of an explosion in the cellar itself.

Mr. *A. W. Millar*, Outdoor Superintendent to the defendants, said he visited the cellar with Skeet on Dec. 20, and examined the walls and roof. There was no discoloration or other sign of explosion; and there was no escape from the service-pipe. In his opinion, the explosion could not have taken place, as the plaintiff had stated, or more injury would have been done both to the plaintiff and the premises; while the meter would not have been wrecked as it was. When the meter was disconnected, there would be possibly one-third of a cubic foot of gas left in it. There would be no danger in this, unless a light were applied to one of the orifices. It was not practicable to entirely clear the meter of gas; the diaphragms would always remain impregnated.

Cross-examined: He considered the plaintiff's account of the accident was an impossible one, if he stood where he said he did. The most explosive mixture of gas and air was about 1:7. On Dec. 20, the plaintiff gave him practically the same account of the accident as he had just given.

Re-examined: He told the plaintiff that they had found the meter shattered—nothing further. The capacity of the cellar was about 730 cubic feet. If one-third of a cubic foot of gas escaped into this space, it would not form an explosive mixture. Between 2 and 3 per cent. of gas in air was not explosive.

Professor *Vivian B. Lewes* stated that on July 20 last, in company with Sir Boverton Redwood, he inspected the cellar in question, which was fairly represented by the model produced. It was ventilated as shown. The floor-boards of the passage above the cellar had shrunk, and in some places there were gaps of $\frac{1}{8}$ inch. If there had been any escape of gas in the cellar for 24 hours, the smell would have been very strong all over the house. The service-pipe was properly capped, and was gas-tight. He now saw the remains of the meter for the first time. The appearance of the cellar was inconsistent with there having been an explosion of any consequence in the cellar itself. The small splinters of wood on the rough boards would have been scorched, and there was an accumulation of cobwebs in the coal shoot which would have been swept away. The explosion must have taken place in the inside of the meter. If it had been reduced to its present condition by an explosion outside of it, the plaintiff would never have left the cellar alive. If one-third of a cubic foot of gas were left in the meter on Dec. 14, its escape into the cellar could not have created an explosive mixture the next day. The light must have been held within an inch of the inlet or outlet of the meter to cause the explosion. The meter was about three paces from the foot of the stairs. The plaintiff's evidence was quite consistent with this. All depended on the difference between one step and two or three; and after such an accident, a man's memory was not very accurate on such minutiæ.

Cross-examined: One could get a slight explosion if the mixture were weak; and a slight explosion might lead to a violent one if there were a highly explosive mixture within reach of the flame of the first explosion. A slight explosion in the cellar, the flame of which reached the meter, would have caused the explosion.

Re-examined: There could not have been such a slight explosion in the cellar without scorching the boards. The red lead found in the plaintiff's eye must have come from the inside of the meter.

Sir *Boverton Redwood* deposed to visiting the cellar with Professor Lewes. In his opinion, the accident was not caused by an explosive mixture in the cellar. His reasons for this opinion were the same as those given by the last witness. It occurred solely in the meter.

Mr. *H. E. Jones* said the way in which the meter had been disconnected, as given in evidence, was the ordinary and proper one.

Mr. AVORY then summed up the defendants' case, and submitted that the Jury must come to the conclusion that there had been no explosion except inside the meter, and that this must have taken place as the result of the plaintiff bringing the match close to one of the orifices. If this were so, he should ask his Lordship to say that there was no negligence on the part of defendants in leaving a small quantity of gas in the plaintiff's meter; and though they must sympathize with him, they could not hold the defendants liable.

Mr. LANGDON, in his reply, relied mainly on the statement made by the workman to Mrs. Marriott that it was all safe. According to the defendants' evidence, the meter having been disconnected, there was a dangerous trap left, into which anyone might fall; and yet they said it was all right. He submitted further that the defendants' elaborate theory as to the explosion was not made out, but that the plaintiff's account was correct; and that his own theory, that a slight explosion occurred outside the meter, and then exploded the mixture inside, agreed perfectly with both the plaintiff's statement and the defendants' theory. He concluded with a few remarks on the amount of damages.

Justice RIDLEY then summed up. He said, in his view of the law, the Company would not be responsible if the explosion took place solely inside the meter. He then went through the evidence, and commented upon it; ultimately leaving it to the Jury to say how, in their opinion, the explosion occurred.

After a short deliberation,

The FOREMAN said the verdict of the Jury was for the defendants, as they thought the accident arose from applying a light to the orifice of the meter.

Mr. LANGDON asked for a stay of execution as to costs, on the ground that, even if the Jury were right as to the cause of the accident, the plaintiff was still entitled, as a matter of law, to the verdict.

Justice RIDLEY said he did not think it was arguable. He should not attempt to stop Mr. Langdon arguing it, but he had no doubt about it.

Mr. LANGDON said he did not desire to press the matter unduly; but it would be very hard on the plaintiff to have to pay the costs, if it turned out afterwards that he was right.

Justice RIDLEY said he did not entertain any doubt on the point, and must decline to grant a stay.

HIGH COURT OF JUSTICE—KING'S BENCH DIVISION.

Monday, Jan. 28.

(*Before the* LORD CHIEF JUSTICE *without a Jury, by consent.*)

English v. Metropolitan Water Board.

The hearing of this case, the earlier proceedings in which were reported last week (p. 291), was continued to-day.

Mr. TINDAL ATKINSON, K.C., Mr. FITZGERALD, K.C., and Mr. BAILHACHE (instructed by Messrs. Deacon, Gibson, Medcalf, and Marriott) appeared for the plaintiff; Mr. ELDON BANKES, K.C., and Mr. A. B. SHAW (instructed by Mr. Walter Moore) represented the defendants.

The evidence of Colonel *Dale* having been concluded,

Mr. *Hennell*, Engineer to the Darenth Drainage Board, gave evidence as to the quantity of water flowing into Colonel English's pond on certain dates when pumping was going on, and when operations were suspended.

Mr. *Gilman*, a member of the Fishing Preservation Society, spoke to the diminution in the quantity of water in the stream and pond after the pumping commenced, and also as to the pollution by oil or grease. The stream had a great reputation as a trout spawning-ground before the pumping.

Mr. *Douglas English*, son of the plaintiff, produced a number of photographs, and gave evidence generally in support of the claim.

Mr. *James Armstrong*, the Manager of the Hawley Paper Mills, which adjoin the plaintiff's property, gave similar evidence.

Mr. BANKES, in opening the case for the defendants, said they claimed the benefit of the Public Authorities Protection Act, which limited any action for damages of this kind to six months before the issue of the writ; and this would be an answer to the charge of polluting the stream, even if it were not disproved otherwise. The principal point, however, was the claim to restrain the defendants from pumping water. On this four questions would arise—(1) whether this pumping-station was not being worked under statutory authority; (2) whether what was complained of was an actionable wrong at all; (3) if it was, whether it amounted to a nuisance; and (4), assuming that the other points were found against him, what was the proper form of remedy. The real cause of the complaint was that the level of the subsoil water had been lowered; but this he should submit gave no right of action.

Mr. *G. R. Strachan* was the first witness called; and he was under examination when the Court rose.

Tuesday, Jan. 29.

Mr. *Strachan* continued this morning his evidence on behalf of the defendants. In November and December last and the present month he investigated the pumping-station and the stream in question, and directed careful gaugings to be made of the water entering and leaving the premises. These gaugings were made every three hours for more than a month, under the inspection of his chief assistant. He gave a minute description of the well, boreholes, and other works, and produced three large diagrams on which he had plotted the results of his observations. The total volume of water pumped was about $1\frac{3}{4}$ million gallons per day. On Nov. 24, he had the engines stopped for two or three hours, and the result was to raise the level of water in the well 10 feet in one hour and 12 feet in two hours; the latter level being 6 inches above that of the stream just outside. The quantity of water abstracted from the stream during its passage through the defendants'

premises varied both seasonally and diurnally. On some days it was 28,000 gallons, and on others only 16,000 gallons; and as the pumps were always going at a regular speed, he attributed any amount above the 16,000 gallons to pumping operations elsewhere, which lowered the level of the subsoil water, and thus withdrew the support to the water on the surface. In conclusion, he expressed a decided opinion that any pollution of the stream by the defendants was rendered impossible by the filters which had been made.

Witness was cross-examined at some length, but he adhered to the view that the water the loss of which the plaintiff complained of went into the subsoil generally, and not into the defendants' works, except to the extent of 16 000 gallons a day. He had not seen the stream in the summer, and had no measurements for that time of year. He could not make any suggestion which could account for what appeared to be oily scum on some of the photographs.

Mr. *Baldwin Latham* said he had heard Mr. Strachan's evidence, and agreed generally with his conclusions. In the year 1878, he made a complete survey of the Darent Valley. The gathering-ground of this station was 94 square miles. He examined the site for the Kent Water Company in 1903, and two years later for the Metropolitan Water Board, when Colonel English's pond had just been formed. It was dug in porous gravel. He had recently visited it again, and, under his advice, certain trial holes were made. On Jan. 24, he found the difference between the amount of water entering and leaving the defendants' premises was 18,000 gallons in the 24 hours. On that occasion there was a little water in the lower part of what was called the "tributary stream," flowing away from the pumping-station. The diminution of water in the stream was undoubtedly due to the lowering of the subsoil water. He also spoke to the propriety of the means taken to prevent any pollution of the stream.

Mr. *W. B. Bryan*, the Chief Engineer to the Metropolitan Water Board, said he had examined Mr. Strachan's diagrams, and agreed with the conclusion he had drawn, that the effect of the pumping was to reduce the level of the subsoil water to the extent of from 10 to 12 inches. He did not think any water from the brook found its way into the well. There was a distinct flow of water in the gravel, apart from that in the chalk. The Water Board had no desire to take any water from the gravel; on the contrary, great expense had been incurred for the purpose of excluding it. He did not think the well affected the surface water for a distance of more than 30 or 40 feet. He agreed with the previous witnesses on the question of pollution. Some sample bottles of water which had been produced by the plaintiff were shown to the witness, who said he could not see any oily contamination; and it was arranged that the samples should be analyzed.

Mr. *William Morris*, a District Engineer of the Metropolitan Water Board, and previously Engineer to the Kent Water Company, said he recollected inspecting the locality in question in 1885 and again in 1899. On the former occasion, he noticed a great many fish in the stream; but on the second he saw none. The pumping-station was purchased in 1900, and the sinking was commenced in September of that year. By October, 1902, the present works were completed; and the sinking of the well and boreholes was finished in February, 1903. Witness gave details of the works, and produced plans and sections of them. He explained that by lining the well with steel tubes and sealing the boreholes the quantity of water pumped was reduced by about a million gallons daily. After describing the means adopted to prevent the escape of oily matter, witness said he was sure that since May, 1906, no oil had found its way into the stream, and only slight traces after June, 1905.

In cross-examination, witness admitted that when sinking the well the chalk that was extracted was thrown into the stream, and might have slightly raised the bed. He did not know anything about the effect on the fish.

R. B. Hocking, the engine-driver in charge of the pumping-station, gave evidence as to the proper working of the filters. He said a pint of oil was used daily in the engine-house.

Mr. *W. G. Morris*, son of a previous witness, an Assistant District Engineer to the defendants, said he inspected the site in 1899 in company with his father, but saw no fish there then, and he was a keen fisherman. In his opinion, the stream looked much the same now as it did in 1899.

Dr. *Alexander Houston*, the Director of Water Examinations to the defendants, spoke to examining three samples of water taken in July last from the stream in question; and they were purer than average samples from the Thames and Lea. The sample drawn where the water left the defendants' premises was slightly better than one taken where it entered. There was nothing to indicate that it would in the slightest injure fish.

Cross-examined: He remembered going in March last year to see some samples of water taken by Colonel English, but could not say that he put his finger into one of the bottles and found the water was oily; nor had he any recollection of being asked to analyze the samples. If he had been, he should probably have refused. Several bottles being shown to witness, he could not say positively whether any of them did or did not contain engine oil.

Mr. *T. L. Humphreys*, a clerk in the Solicitors' Department of the Metropolitan Water Board, spoke to going with Mr. Morris to the pumping-station last July, and meeting Colonel English. The latter pointed out what he said was oily scum; but Mr. Morris did not agree with him. On that occasion the water was flowing from the Darent, and he saw a lot of oil on the water in the river. He could see about 60 yards of the surface, and it was covered with a film of oil.

This completed the evidence, subject to the production of analyses of water, and the further hearing was again adjourned.

His Lordship intimated that it would be more satisfactory to him to inspect the premises himself before giving judgment.

This was agreed to by both parties.

Wednesday, Jan. 30.

On the resumption of the case this morning,

Mr. Atkinson said the analyses of the water had not been completed, but they should be forwarded to his Lordship, if they were not ready before the argument was concluded.

Mr. Bankes, on behalf of the defendants, said it seemed worthy of consideration whether this was a genuine action on the part of Colonel English in respect of any injury he had really sustained, or was not an attempt by a certain body of persons, of whom the plaintiff was one, to stop altogether the pumping at this place, in order to obtain an ulterior object in respect of which there was no legal remedy. No stress had been laid, in the evidence, on any injury suffered by the plaintiff—in fact, his name did not appear in the course of the correspondence which preceded the action, until just before the writ was issued—the complaints being all made on behalf of the Darenth Fishing Preservation Society, and being for the most part confined to the question of pollution. The plaintiff was a riparian owner for about 80 yards only along the stream in question, because he could not enlarge his rights by making the cross-cut from the pond to the Darent. With regard to the pond also, he submitted that it was not primarily made for the purpose of watering cattle, but as a sort of observation hole, to see how much water was abstracted; and the bottom was purposely kept clean, so that as much water as possible should drain away from it. After dealing shortly with the question of pollution, the learned Counsel referred to the Metropolis Water Act, 1902, and the Public Authorities Protection Act, and submitted that under the latter no claim could be made for damage caused more than six months before the issue of the writ. Turning to the more important point of the abstraction of water, he cited various authorities, which he submitted showed that a person was absolutely entitled to withdraw any quantity of subsoil water, so as to prevent it getting to the surface. In this way he could absolutely pump a stream dry; and it would be very strange if, in consequence of a temporary stoppage of pumping, water got into the stream, he could then be restrained from pumping in future, because he would be taking the water from a defined channel. The Kent Water Company had statutory power to make the well, which was the first step. It was thoroughly established that there was no right of support to land by water; and it seemed to follow that there was no right of support to water. In the case of *Sugar v. Grand Junction Canal Company*, the water was taken by a lateral cut—it was not a question of support at all; and this case had been commented on and explained in *Jordeson v. Sutton, Southcoates, and Drypool Gas Company*, in the Court of Appeal.* He was proceeding to argue against the granting of an injunction in this case, when his Lordship intimated that he need not pursue the matter further.

Mr. Atkinson, in reply, said he hoped to show that the plaintiff was entitled to an injunction in a case like the present, where the defendants insisted on their right to do what they were doing. The Act of 1888, under which this pumping-station was acquired and erected, contained a provision that nothing therein should exonerate the Company from any action, indictment, &c., for nuisance, in the event of any being caused by them; and he submitted that this action, if unlawful, was a nuisance. The Public Authorities Protection Act did not here apply, because the Act of 1902 transferred all liabilities of the Kent Company to the Metropolitan Water Board; and a cause of action then existing would inure against the present defendants. He went on to refer to some previous decisions as to the right to water, and relied particularly on a statement in the House of Lords that if it was not possible to get at the underground water without touching that which was flowing in a defined channel on the surface, one could not get it at all. The practical difficulty which had been raised by Mr. Bankes in the interest of the public, that pumping would have to be stopped altogether, was quite illusory, because all the defendants would have to do would be to send down the stream as much water as they abstracted from it, which was a very small proportion of the quantity pumped. He concluded by commenting on the evidence with regard to the pollution.

The case was then adjourned for the analyses of the water to be put in.

Thursday, Jan. 31.

This morning a report was handed in, and

Dr. *J. A. Voelcker* was called, and gave evidence with regard to it. He said he had examined samples taken on March 2 and 6, June 12, and Oct. 5. In the March and October samples, he found oily matter present; but that taken in June was practically free. He could say certainly that in the October sample there was mineral oil; and he had reason to think there was some in the March samples, but was not so positive. The examination was very difficult, owing to the length of time the samples had been kept, during which there had been considerable vegetable and fungoid growth. He could not express any opinion whether the mineral oil present was more likely to have come from a paper-mill or a pumping-station. The oil in itself would not be injurious to fish; but indirectly, by forming a scum on the surface, it would prevent proper aëration and oxidation of the water, and in this way would be very prejudicial to fish life.

The case stood over for judgment.

Thursday, Feb. 14.

The Lord Chief Justice delivered his considered judgment this morning. After stating the nature of the action, the position of the pumping-station, and the character of the works—consisting of a well 110 feet deep, lined to a depth of 75 feet with steel cylinders, and two boreholes, 131 feet deep, similarly lined, one of which communicated with the well, by an adit—he said the matters of which the plaintiff complained were three. The first was the pollution of the brook which adjoined his land, and the cross cut connected with it, by chalk mud, deposited in the brook by the Kent Water-Works Company, when the well and boreholes were sunk, which was not disputed; and the second, pollution by oil and grease from the engines at the pumping-station. As to this his Lordship went carefully through the evidence, and arrived at the conclusion that some pollution had occurred on several occasions, which was an injury to the plaintiff, though he had little doubt that with reasonable care the filtering works constructed by the defendants for the purpose of preventing such pollution would, if properly managed, avoid any appreciable nuisance from such a cause in future. With

* See "Journal," Vol. LXXIII., pp. 807, 992, 1381, 1766.

regard to these two matters, the defendants relied on the Public Bodies Protection Act (56 & 57 Vict., cap. 61). But the plaintiff contended that this Act did not apply to the Kent Water Company, and that, having regard to the terms of the Metropolitan Water Act, 1902, the defendants were responsible for what was done by their predecessors. He thought the contention was well founded; and he assessed at £100 the damage to plaintiff arising from these two causes. The third and most important matter of complaint was the abstraction of water from the brook, which it was alleged by the plaintiff's witnesses was never dry, winter or summer, before the operations at the pumping-station commenced, whereas it was now admitted by the defendants that the quantity of water flowing down the brook was diminished by their operations to the extent of from 16,000 to 28,000 gallons per day; and the evidence showed that for a period of six weeks in 1905, the brook was practically dry. The plantiff's witnesses put the amount abstracted at from 26,000 to 110,000 gallons per day; but their measurements were taken with less exactitude, and at a different point, below a pond which the plaintiff had dug; and, in his (his Lordship's) opinion, the existence of this pond substantially diminished the quantity of water passing in consequence of percolation through the bottom. Still, the admitted loss of 16,000 gallons per day was substantial, and might in summer time be of considerable value; and, if the defendants' acts could not be justified, it would entitle the plaintiff to damages, and possibly to an injunction. This raised an interesting and difficult question of law. As he had already stated, the well and boreholes were steel-lined to a great depth, for the purpose of excluding the surface water; and he found as a fact that no water from the brook got into the well, and therefore none was pumped by the defendants. The diminution was, in his opinion, due to another cause—viz., to the withdrawal of support by a fall in level of the underground water. This was established by the diagram put in by Mr. Strachan, as well as by the evidence, which showed that the 1¾ million gallons of water pumped daily was derived, not from the surface, but from a vast underground body of water flowing through the fissures in the chalk. The analysis of the water pumped at Darenth showed it to be of exceptional purity, without any trace of admixture with surface water. His Lordship then dealt with the contention set up by the defendants that they were authorized by statute to do what they were doing, and said that, in his view, this was immaterial, because section 8 of the Kent Company's Act of 1888 expressly provided that nothing in the section should exonerate the Company from any action, indictment, or other proceeding, in the event of any nuisance being caused by them. He could not accept the contention of Mr. Bankes that the words used applied only to the construction of the works, and not to their maintenance and working. The act complained of was the alleged abstraction of water from the brook, to the flow of which the plaintiff, as riparian owner, was entitled; and it seemed to him that an action founded on such a claim would be an action for nuisance. This was in accordance with the definition of the word "nuisance" in Blackstone and other text-books, and was covered by the decision in the case of *Jordeson v. Sutton, Southcoates, and Drypool Gas Company*. He thought therefore that the statutes under which the defendants were working afforded them no protection if the act complained of gave rise to a good cause of action at common law. He thus came finally to the difficult question whether the abstraction of water under the circumstances of this case gave the plaintiff a cause of action. The plaintiff relied on the case of the *Grand Junction Company v. Shugar*, the head note to which said: "Although a landowner will not in general be restrained from drawing off the subterranean water in the adjoining land, yet he will be restrained if in doing so he draws off the water flowing in a defined surface channel through the adjoining land." The question was as to the precise meaning of the words "drawing off." If it had been shown that the defendants, by their operations, had directly drained or tapped water from the brook, he should have applied the principle of the judgment in Shugar's case; but, having regard to the authorities, he was of opinion that the diminution in quantity by the withdrawal of support did not come within the principle laid down. Having found as a fact that no water from the brook got into the defendants' well, and that the only effect of the pumping was to lower the level of the subsoil water from 10 to 12 inches, he came to the conclusion that, though not expressly protected by statute, no action could be maintained by the plaintiff against the defendants in respect of the abstraction of water. Had he taken a different view, it would clearly not have been a case for injunction. The damage occasioned in the past was comparatively trifling; and under no circumstances should he have assessed the amount at more than £50. The result would be that the plaintiff would have judgment for £100 with costs; but the defendants would have the costs occasioned by the insertion of the claim for the abstraction of water, on which the action failed—one set of costs to be set off against the other.

Inequality of Water-Rates.

At the Westminster County Court last Friday, a summons by the Metropolitan Water Board against Mrs. Greenland was one of 106 claims for water-rate heard by the Registrar (Mr. C. R. Cuff). The defendant, a resident in Fairfax Road, Hornsey, appeared in person; and Mr. Desmond Collins, the Assistant-Solicitor to the Board, supported the claim. Mrs. Greenland said she had paid the same amount as her neighbour; and she contended that this was all the Board could recover, as the rent and local rates for the house next door were precisely the same as hers. Mr. Collins said defendant resided in the borough of Hornsey, which was not in the Metropolis. Being out of the Metropolitan area, the Board had to assess the value; and the system was to assess a fair rental value and deduct one-fifth or one-sixth for insurance and repairs. The Registrar went into the figures, and said he could not hold that the assessment was unfair. He therefore ordered the defendant to pay the amount claimed.

At a recent meeting of the Teignmouth Urban District Council, it was decided to apply to the Local Government Board for authority to borrow £150 for additional retorts at the gas-works, and to inform them that £540 would be required for telescoping the gasholder.

MISCELLANEOUS NEWS.

SOUTH METROPOLITAN GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the City Terminus Hotel, Cannon Street, E.C., last Wednesday—Sir GEORGE LIVESEY in the chair.

The SECRETARY (Mr. Frank Bush) read the advertisement convening the meeting, and also the minutes of the last half-yearly meeting. The seal of the Company was then affixed to the register of proprietors, and the report and accounts, for the six months ending Dec. 31, which have already appeared in the "JOURNAL," were taken as read.

THE COMPANY'S STOCK—THE REPORT AND ACCOUNTS.

The CHAIRMAN: Ladies and gentlemen, as usual, we have been as explicit as possible in the accounts, and up to last night I thought there would be very little for me to say about them; but in what may be called the Money Article in the "JOURNAL OF GAS LIGHTING," which I was reading last night, I read that they were unsatisfactory. It said that there was a fall of one point in the South Metropolitan stock owing to the unsatisfactory character of the half-yearly report. Well, as to the stock, it stands pretty well as compared with that of the other Companies; the 4 per cent. stock standing at 128, while the Gaslight and Coke Company's 4 per cent. stock, after a very satisfactory report and meeting, went from 100 up to 101, but has now gone to below 100, and the Commercial Company's 4 per cent. stock stands at 112. So that I do not think there is anything very unsatisfactory in the position of the South Metropolitan Company's stock. Now as to the report. In speaking about this, I do not want to make comparisons, but one must refer to one or two points, and anybody speaking about the report of the South Metropolitan Company, and having in his mind the reports of the two other London Companies, must never forget the difference in price, and that we are selling gas at a much lower figure than they are. We are £15,000 short on the half year. But if we had charged the same price as one of these Companies, we should have had £120,000 to the good; and if we had charged the same price as the other Company, we should have had £240,000. This shows the necessity of considering the question of the price of gas. There is a deficiency of £9000. In June, 1904, we started with an undivided balance in hand of about £65,000; and having had a good half year, we reduced the price from 2s. 1d. to 2s. I am not sure that this would have been done by other people; but the South Metropolitan Company's policy has always been to reduce the price whenever we have had the opportunity, and felt ourselves able to do it. There was a big drop in coke immediately afterwards; and the result was that in the December half of 1904 there was a considerable deficiency—something like £28,000. But the £65,000 with which we started in June, 1904, has lasted us up to the present time, and there was about £6000 left when we entered on the December half year. The £15,000 will absorb the £6000, and leave £9000 as the net deficiency; and I have no doubt that this £9000 will be recouped in the June half year. But there is something more to be said. The June half years are always the best; and I will tell you why. We cannot take the indices of the consumers' meters on a fixed day. We cannot take them all on the 31st of December and the 30th of June; it is a work of about three weeks—about two weeks in the latter part of December, leaving one week in January, and the same in June. The consequence is that a considerable proportion of the consumers' accounts are made up to some date in December; and whatever gas they burn after that date goes into the June half year, and is paid for in it. Then the same thing happens in June. But in the fourteen or fifteen days at the end of December a great deal more gas is burnt than in the fourteen or fifteen days in June; and consequently the June half year gains, the December half loses. The South Metropolitan Company have only once (1893) had to record a decrease in the consumption. In the present year, there is an increase of 1¼ per cent. We explain in the report how it is that this is so small. It is rather owing to our pushing the use of the incandescent mantle. Anyone who will go into South London—it is an out-of-the-way place, and not many people travel to it except those who live there—will find in the streets, if they look into the shops, both big and little, the incandescent mantle everywhere, and the shops magnificently lighted. The unaccounted-for gas in the June half year was 1·46 per cent., and in the December half year 6·2 per cent.; giving an average for the year of 3¾ per cent., which is a very low figure.

THE PRICE OF COAL.

I now come to the paragraphs of the report which deal with coal. I may say at the outset that cheap fuel, solid or gaseous, is as necessary for England as cheap bread; and, notwithstanding the fact that people are finding fault with the gas companies for talking about or objecting to pay increased prices for coal, we are bound to protest, and do everything we can to prevent the charges increasing. The coalowners are now saying: "Oh, we lose money at all ordinary times, and we only look to make up the loss by these booms; and here you gas people are grudging us these." I have been pretty well acquainted with the history of the gas coal trade for many years. Prior to 1872, the price was uniform, and never varied more than a few pence per ton; and 6s. was about the maximum price—5s. 6d. to 6s. But in 1872 there came the first coal panic, and the price then went up. I am speaking of the price free on board in the Tyne—at the pit's mouth, you may say—for gas coal. In those two years, 1872-3, the price went up to 20s. per ton free on board; and it was 1877 before it came back again to the old figure. This was a very trying time for gas people. But they got through it, and then we went on with a fairly average medium price up to 1890. The year 1872 was the beginning of the first boom; the next one began in 1890; the next in 1899; the next in 1906. So they are coming rather too close. We went on very well from 1876 to 1889, and then prices began to rise again. Our contract prices in the seventies were about 6s. per ton. In 1889 they went up to 7s., and in 1890 to 11s. Then they began to go down again; and

in 1893 the price had dropped to 6s. 3d.—had got back to the old figure. So it remained for several years—6s. 3d., 6s. 4½d., 6s. 6d., 6s. 9d.—until in 1899 our contracts went up to 7s. 11d., or a rise of 1s. 2d. In 1900 the price rose to 16s., and then began to fall; but there were five years of high prices. In fact, prices have been high all the time, and have never come back to the figure of 6s. 6d. The price returned to 7s. 6d. in 1904-5; in 1906 it went up to 8s. 3d.; and this year we are threatened with I do not know what. I protest with all my power against this doctrine of the coalowners that they must have these booms in order to recoup themselves. We do not object to paying a fair, reasonable, and legitimate price to coalowners or anybody else at all times; but we do object most strongly, and as emphatically as it is possible to object, to these outrageous increases of price, which are so disastrous to the gas industry and the country in every way. What is the reason for them? I daresay you have seen a good deal about it in the newspapers. I have here a cutting from the "Standard" of the 7th of this month. They had been inquiring into the subject of the coal trade: "Another gentleman laid the blame mainly upon the export trade. 'The great demand,' said this gentleman, 'comes from German, French, and Belgian manufacturing centres; and what is needed to put things right is not so much agitation against the high price of coal as a reform of our fiscal system.'" Well, I am not going into that thorny subject. The statement there, according to all I can learn and all that we can ascertain, is one of simple fact. The increase in the price of coal is greatly due to the large foreign rather than to the English demand. This statement is corroborated in other quarters. It is due to the large foreign demand, which has increased very much since the coal duty was taken off. Now, I am a Free Trader, but I am not going to argue that question. There is much to be said on both sides, no doubt; but there is one point on which I feel strongly. The foreigner imposes a heavy duty on all our manufactured goods; but he is wise enough to admit coal free of duty. Now, what are we doing? We are supplying him with cheap coal to enable him to compete with us in our own markets and in those of the world. [Loud cheers.] I do think that the action of the Chancellor of the Exchequer last year is inexplicable. I cannot understand why he should have taken off that 1s. a ton duty on exported coal.

A SHAREHOLDER: He never ought to have taken it off.

The CHAIRMAN: You are quite right, sir; and why it was taken off one does not know, but can only guess. At any rate, the effect has been to largely increase the foreign demand; and it has enabled our coalowners to get better prices for their coal. There is another thing. The duty was limited to coal above 6s. per ton in price free on board, and whereas prior to taking off the duty the price was 6s., or just under it, for small steams, directly the duty was taken off, up went the price of small steam coals to 7s. and 8s., and our own manufacturers have to pay these higher prices for steam coal simply because the market abroad was opened to them. Well, it is a very wide question, and one looks at it from a rather broader view than simply that of the gas people or the immediate users of the coal. Coal is the nation's capital. Without coal, where should we be? Where could we be? We are dependent upon it for our existence as a nation. If coal becomes dearer, we are necessarily and naturally falling behind in the race of nations; and if it becomes, as it will become, dearer, if this principle of exporting all that is possible is continued, what will posterity say if we, in our fatuity, have parted with, to the foreigner, that on which Britain's greatness in a material sense depends? My own feeling on the matter is that, for the protection of our own national interests, no coal ought to be allowed to be exported. We cannot, I suppose, do this; but we can impose a duty on it that would practically prohibit its export, and whether I am a Free Trader or not, I certainly go for that. Now, these coalowners are making a good deal of fuss about it, but here is one gentleman—the chairman—speaking at a dinner given to a Quayside veteran, the "fitter" of an important colliery. He says: "There are times in the history of every colliery when it is impossible to work at a profit, and owners often are thankful if, after providing for the necessary depreciation, their accounts do not show a loss. I know of no industry that exacts such sacrifices and demands the exercise of such skill, care, and attention. I also know of none to which a fair measure of profit in prosperous times is so bitterly grudged by the mercantile community at large—whether it be shipowners, gas companies, ironmasters, coking concerns. They all seem to grudge collieries an occasional meed of profit." When coalowners state that they make no profits except on these booms, I am not quite prepared to accept all they say. Now, this gentleman goes further, and says that "gas companies vie with one another in stoutly demurring to pay the fair market price of the day." Well, you will be rather surprised to hear that the speaker is a gas director, and his principals have just negotiated the sale of coal to the Stockholm Gas Company at the price of 12s. 6d. per ton, which is an advance of about 4s. on last year's figures. Now, here is another extract from the "Iron and Coal Trades Review"—the official organ of the National Association of Colliery Managers. It is dated last Friday. They are rather put out about the Gaslight and Coke and South Metropolitan Companies, and they say: "At the present time, gas undertakings are face to face with a large rise in the price of gas coals." This is what the official organ of the National Association of Colliery Managers says. We are "face to face with a large rise in the price of gas coals." "And, what is equally important, the coalowners are, by reason of local associations of collieries, producing gas coals under excellent circumstances for taking advantage of the situation." The coalowners by that statement show they are combining to take advantage of the position; and this is said by their own organ. Well, then, they complain about me: "Sir George Livesey is crying before he is hurt, when he asks for a conference of gas companies and gas committees to discuss some common action for resisting the demands of the collieries supplying gas coals." Well, what are we to do? Are we to remain meekly sitting down and let them take all they choose from us? Certainly not, if we can help it. We must resist them in every possible way. Now, they make some mistakes. They say that we, the gas companies, are doing very well. "Nevertheless, the Gaslight and Coke Company show a balance of revenue over expenditure over 1s. per 1000 cubic feet." Now they ought to be more careful, because the Gaslight and Coke Company show nothing of the kind, for their surplus on the half year is only one farthing per 1000 feet. Then they say: "The South Metropolitan Gas Company are distributing dividends at the rate of 5½ per cent. per annum to their shareholders. The fact is that gas manufacture is one of the most uniformly successful industries in the country, and it would be possible to supply customers at lower rates and still earn handsome dividends." Well, they are wrong. I do not blame them so much for that—about our dividend of 5½ per cent. We are nominally paying 5½ per cent. But it is thirty years ago last year since Parliament introduced the auction clauses; and all our new capital has been sold by auction. People buy it. We have just issued £100,000 of stock at 128. They take it at the market price, which yields them 4¼ per cent.; and that is all gas shareholders get. I do not know that I need trouble about any more of these things. There is the "Newcastle Daily Journal," with something of the same sort; but I think I have said enough on this point. I do not object to men getting good wages; but it is an extraordinary fact that whenever wages go up, the output of coal per man diminishes. I believe there are some coalowners who have great difficulty in making both ends meet. I am not going to say there are not some who have hard work to do that. One with whom we have done considerable business for many years said he could not supply us last year at the price of 8s. 3d. per ton, because he would be actually losing money; and I believe he was in that position. But why was it necessary to lose money? He told me that 10 per cent. of the men who hew the coal were absent constantly, and that after pay day 30 per cent. of them were absent—disorganizing everything. Supposing 30 per cent. of our workmen were absent after pay day, where would the gas supply be, and where should we be? A great deal of the extra cost of coal is due to this. The clamour for the eight hours' day is purely a Socialist demand, and is made for the purpose and object, as witness after witness admitted to the Labour Commission, of absorbing the unemployed; for they felt that if all the unemployed were absorbed, trade unions would really be masters of the situation. I put this question to witness after witness: "Supposing you got an eight hours day, and supposing there were still unemployed, what what you do then?" The reply was "Reduce to six hours." Mr. Tillett was one of the witnesses I put the question to; and again I asked: "Supposing you had a six hours day and you still had unemployed, what would you do then?" The answer was "I would reduce to four hours, and compel all the rich people to work as well as the poor."

PRICE OF COAL AND THE COMPANY'S DIVIDENDS.

Well, I think I have talked long enough on that subject. But this I will say, that if coal advances in price seriously, we shall be obliged to increase the price of gas. There is no doubt of that. We have struggled hard to keep it down to 2s. per 1000 cubic feet; but if the price of coal advances seriously, it must go up. I may say this to the shareholders—we have not paid full dividends, we have not earned full dividends, since we reduced the price in June, 1904. We have never paid the full dividend to which you are entitled—namely, £5 14s. 8d. per cent. You are entitled to 2s. 8d. per cent. for every penny of reduction in price below 3s. 1d., and 2s. 8d. per cent. on the 2s. price is £1 14s. 8d. added to the standard dividend of 4 per cent. Well we should not have paid that odd figure, but we should have paid £5 13s. 4d. Now, what does it come to? If we increase the price by 1d., there would be no reduction of dividend, and the 1d. would give us £52,000 a year. We should be entitled to £5 12s., and should pay £5 10s. If we increased the price by 2d., the dividend would be reduced to £5 9s. 4d. That is very near 5½ per cent., and there is no reason why we should not pay the £5 9s. 4d.; but it is a little extra trouble to calculate. If we increased the price by 3d., the dividend would have to come down to £5 6s. 8d.; so I think the shareholders may go away with the feeling that there is not likely to be any large reduction of dividend, even if the price of gas coal should be more than we expect. If the price of coal should go up 4s. a ton—though we do not believe it will be anything like that—that would mean about £700,000 more to be paid by the consumers of London, of which nearly a quarter-of-a-million would be our consumers' share.

THE QUESTION OF RATES.

There is one other matter of great importance—the question of rates. These have gone up 12 per cent. over the preceding year. There has been a reassessment; and we are engaged in an appeal. No ordinary article of common use that I am aware of pays anything like what the consumer of gas pays in rates. Seven per cent. of what he is paying for gas goes in rates. Whereas on ordinary trades—butchers, bakers, candlestick makers, and other common trades—the average rate is 1 per cent., on gas it is 7 per cent. A few years ago, it was 3½ per cent. Now it has got up to 7 per cent.; and we must do what we can to reduce it. The great increase of rates is due very largely to the extravagance of the people who spend the rates. They are idealists many of them; and it is rather a dangerous thing to have idealists with other people's money to deal with. The late Mr. Ruskin was an idealist; but he spent his own money. But with such idealists as those on the London County Council, it is the money of others that they risk and lose. One of the principal officers of an important London borough told me when we were talking about rates, that the cause of the high rates was the direct employment of labour; and he gave an instance. He said: "We have our Works Department, and do our own work. We can hire from respectable and responsible firms a horse, cart, and man, for less than 10s. a day; but the very lowest cost to the borough is 17s. a day, doing the work ourselves." And the same may be said of the London County Council. The latter boast a great deal of the profit they make on the Works Department. But how is it made? An officer of the Council specifies certain work and estimates that it ought to cost so much, and another officer of the Council does it for something under the sum his brother officer specified. The only test of an estimate is public competition. If an engineer or an architect or anybody makes an estimate, he is very likely to be mistaken; he may be too high or too low. But put it up to the test of competition, and you can ascertain what ought to be the price. The London County Council, however, do not do that. Their own officer estimates it, and their own officer does the work; and under these circumstances, of

course, the cost of the work may be expected to be below the estimate somehow or another.

THE QUESTION OF MUNICIPAL TRADING.

Then as to municipal trading, of course, I believe that is utterly and altogether wrong. I consider it is going in the direction of Socialism, and will be ruinous to the country. This is my well-considered opinion and belief. Practically the London County Council are prepared to undertake work of all kinds. They were rather angry with the Socialist leaders. Their Socialist wing was going rather too fast; but they themselves want to get an enormous electricity scheme and other businesses into their hands. Now, these gentlemen cannot manage these businesses. We know how difficult it is to get directors and men to manage joint-stock companies. The weakness of joint-stock companies is the difficulty of getting directors who understand the business and are capable men in every way, and suitable for the purpose of directing such businesses. The London County Council and the Borough Councils are not elected for their business capacity, but for other reasons—for their ideals, most likely. Now, what do they do? They appoint a Committee. The whole body is re-elected every three years; but I believe it is said to be in accordance with democratic principles that they must change every year, and their chairmen are changed every year. Whether a man is a good chairman or not, does not matter. He is in office for a year, and then another one takes his place. What would happen with a business and a company like ours if you changed your Directors and your Chairman constantly? A man is not long enough in office to get an interest in it or an understanding of it. Especially when you remember that the gentlemen are not elected for that purpose at all. There are schemes now for municipalizing everything. "The Times" of Jan. 31 had a long story about the London County Council; and they gave the programme of the Radical Federation in December, 1891, in which there were all sorts of things they proposed to do—among the rest to take over the plant, &c., of gas companies at a valuation. The programme of the Socialist Labour Party, recently issued, proposes to do all sorts of things—to take over the docks and the coal, the supply of milk, and the electric supply; but, as "The Times" says: "There is one remarkable omission, which deserves particular attention. No mention is made of the gas supply; it is quietly dropped out of the programme. Why? Simply because the workmen employed by the South Metropolitan Gas Company are shareholders in the concern; and the proposal to deprive them of their property would be resented. Only those things which belong to somebody else are to be municipalized for the benefit of 'Labour.'" Well, I do not think that is the only reason; but I think it is the South Metropolitan Company who have staved off the municipalization of the gas supply. What could the London County Council do? If they took over the gas supply they would have to equalize the price, and that equalization would mean an increase of price in South London by 6d.—from 2s. to 2s. 6d.; and I think that is a thing they are not prepared to face. They would never be allowed to charge two prices. They would have to equalize the price; and it is rather satisfactory to feel that the South Metropolitan Company have put a stop to that iniquity.

RELATIONS BETWEEN COMPANY, CONSUMERS, AND EMPLOYEES.

The only other paragraphs I have to refer to in the report are Nos. 5 and 6. In the former we say that the troubles and difficulties already referred to "are only temporary and will pass away or be overcome. On the other hand, the Company have two great sources of permanent satisfaction. The confidence and goodwill of the consumers has been gained by many years of fair and considerate treatment. This policy of the Directors has been loyally and sympathetically carried out by the Company's officers and workmen, who come in contact with, and therefore represent, the Company to the consumers; and its success is largely due to their co-operation." Well, that is a very satisfactory thing. Thirty years ago I said that the British public were right at heart, and that if they were fairly treated they would respond in the right spirit. I said that in 1874, when I was President of the British Association of Gas Managers; and I am here now, thirty-three years after, to say it is perfectly true. That is the policy we have tried to follow with our consumers. We have tried to carry out what the late Mr. Whiteley gave as one of the best axioms in all business: "Be honest." I think our consumers realize this. We are constantly receiving testimony from customers to the effect that they appreciate the way in which our people have now for many years treated them. The consumers appreciate it, and we have their good-will. Then as to the employees. President Roosevelt the other day, when the Nobel Peace Prize—a money prize of some £7000—was given to him, said he intended to devote it to the purpose of promoting industrial peace; and he used the words (I thank him for them): "Righteous peace in the industrial world, for righteous peace in the industrial world is as important as peace in the world of nations." Now, that is what we have been trying to do, ladies and gentlemen, in the world of our employees. In a paper sent to me the other day from America, I saw that another American, Mr. Carroll D. Wright, the head of the American Government Labour Department, said there had been all sorts of attempts made to reconcile capital and labour—conciliation boards, joint committees, collective bargaining, co-operation (I do not think he used the word "co-partnership"), profit-sharing, and the like—but he said we come back to the Decalogue; or rather he said—I put it in his own words—to Christ's words: "To love your neighbour as yourself, and do unto others as you would they should do unto you." That, I may say, is the effort of all of us. It is a high standard. We are trying to do that. It is our object and our desire to do to our workpeople as we would that they should do to us. We expect them to do the same in return; and I think I may say they also try to do so. We are trying to help them to help themselves. It is not increase of wages, it is not mere money, that is going to do the workpeople so much good, but it is in helping them to the ownership of property; and that is a thing we have succeeded in doing beyond expectation. Nobody had ever thought anything of the kind was possible. If I had been told, or if any man in England had been told, seventeen years ago, that in 1907 all the employees of the South Metropolitan Gas Company would be shareholders in the Company, and hold a considerable amount of stock, I should have said: "You are talking nonsense; it is utterly impossible—it is utterly incredible." But it is done; and if employers would so use their influence and their power to help their people to become owners of property, it would do a great deal to cure a large part of the social evils from which we suffer. The last paragraph of the report I need say nothing about, as you will have that presently. I conclude by moving: "That the report and accounts now presented be received and adopted, and the report entered on the minutes."

Mr. SIMPSON ROSTRON seconded the motion.

Mr. HOGARTH congratulated the Chairman on the splendid form he was exhibiting and his fighting courage. He also expressed satisfaction that the Board were determined to fight the rating question.

The motion was unanimously adopted.

THE DIVIDEND RESOLUTION.

The DEPUTY-CHAIRMAN (Mr. John Mews) moved: "That a dividend at the rate of 5½ per cent. per annum be now declared, and that the warrants be transmitted to the registered addresses of the proprietors by post."

Mr. J. A. BUTCHER (a Workman Director), in seconding the motion, assured the meeting that the workmen were animated by a desire to serve the Company. They had every confidence in the ability and integrity of the Directors, and it would not be their fault, as workmen, if prosperity were diverted from the concern. As the co-partnership system had been so successful, he was puzzled to know why it was not more extended.

The CHAIRMAN, in putting the resolution, said there need be no fear whatever as to the dividend of the next half year, as the current half year had begun well, and there were good increases; the June half year being also the better half.

The resolution was carried unanimously.

RE-ELECTION OF DIRECTORS AND AUDITOR.

The DEPUTY-CHAIRMAN: It is now my duty, and also a great personal pleasure to myself, to move the re-election of our Chairman upon the Board of this Company. Son of an officer of this Company, and born and brought up in the neighbourhood of one of the gas-works, he has always been endeavouring to find out all that could be found out about the manufacture of gas and the management of the business. In this he has been most successful. You all know he is a most able gas engineer; and, in addition to that, a most able man of business and a most generous administrator, as you have heard to-day from Mr. Butcher, who represents the men, and a most sincere friend of all here. Let me just very briefly tell you what, to my mind, are a few of the salient points of the history of this Company since he has had the management of its affairs. To begin with, the South Metropolitan Gas Company was comparatively small as compared with the Companies with which it amalgamated. First of all it amalgamated with the Surrey Consumers; then with the Phœnix, which was a rather larger Company; and then with two other Companies in Woolwich. It was, of course, a great thing to get the gas supply of the South of London into the hands of one Company, because that tended towards economy. Then the shareholders were divided into three classes, as possibly many of you remember, "A," "B," and "C." These classes of shareholders received different rates of dividends; and it struck the Chairman and others that it would be a good thing to range all these shareholders in one class. Possibly many of you will admit that difficulties that might have occurred had been entirely done away with by reason of the amalgamation of all those interests into one common ordinary stock. That, of course, is a great advance upon what had been before. Then, I think, I may say that this co-partnership has been one of the most remarkable things which has taken place, with the result of our seeing Workmen-Directors upon the Board. Another great advance has been the pushing of the incandescent gas-mantle, which has had an enormous effect on the industry, not only in London, but all over the world.

Sir FORTESCUE FLANNERY seconded the resolution, and referred to the services rendered by Sir George Livesey in respect of the removal of certain restrictions upon the gas industry in connection with the purification difficulty, and the saving of a large sum of money which gas companies had formerly to spend every year in unnecessary purification. It was very pleasing to hear the Workman Director testify to the affection with which Sir George Livesey was regarded by the workmen of the Company. He noticed that, although there were some 4000 of the workmen included in the profit-sharing scheme—they had not got them all—the number of employees being some 5000 in summer and 6000 in winter. He hoped that in the near future the efforts of Sir George Livesey and his colleagues, and of the workmen themselves, would result in every one of the permanent staff becoming a shareholder.

The DEPUTY-CHAIRMAN put the resolution, which was carried unanimously.

The CHAIRMAN: I thank you, Mr. Mews and Sir Fortescue Flannery, and this meeting, very warmly for this kind recognition of my services to the Company. It has occupied my business life; and I hope to be useful for some time longer. I should like to say one word about Sir Fortescue Flannery's remarks as to the discrepancy between the 4000 and 5000 shareholders. Nearly all the others are shareholders, but not in their own names. These 4000 hold the stock in their own names, but a large number have holdings in the names of trustees. They are shareholders all the same; but stock is not registered in their names. Mr. Bush tells me that all the regular men are shareholders. Now I have to propose a resolution myself: "That Mr. Robert Morton be re-elected a Director of this Company." Mr. Morton was for many years Engineer of one of the Woolwich Companies and of the Phœnix Company, also the London Company. Now he represents two of these Companies on the Board. Shortly after his retirement, we were fortunate enough to get him here, because men who have had practical experience in the management of gas-works are most necessary on the Board. Mr. Morton is a man whose sympathies are in the right place. He is thoroughly devoted to his work, and anxious to do all he can for the benefit of the Company, the consumers, and the employees.

The motion, having been seconded, was adopted.

Mr. MORTON briefly acknowledged his re-election.

Mr. GEORGE HOWLETT moved: "That Mr. Thomas Spooner Soden be re-elected an Auditor of this Company." He said Mr. Soden had been for many years Auditor of the Company. He had been tried and not found wanting, and they had confidence that, as in the past, he would carry out the duties to the entire satisfaction of the shareholders. He congratulated the Chairman upon the meeting. It had been somewhat querulously supposed that the price of gas would be put up in consequence of the increased price of coal. Like Sir George, he had had a good deal of experience of coalowners, who always seemed to be losing. He was reminded of a story of a wealthy manufacturer who promised a certain sum for the building of a free library in his parish. It was found it could not be built for the money. So he went to him again; but his answer was he could give no more, as he had lost money the previous year, by which he supposed he meant that his profits, instead of being £120,000, had only been £90,000. He thought the loss of the coalowners must be on somewhat the same scale. When times were booming, they piled up the money; and if the prosperous state of things was not perpetuated, they began to squeal. He did not believe the price of coal would be raised without a struggle; and he hoped they would be able to get on without raising the price of gas. Their present position was the fruition of years of magnificent effort, and it would be a sad thing to have to go back.

Mr. HOGARTH seconded the resolution, which was carried unanimously.

VOTES OF THANKS.

Mr. HOWLETT proposed a hearty vote of thanks to Sir George Livesey and the Directors. He said every man on the Board was of use, and there was no square peg in a round hole.

Sir FORTESCUE FLANNERY seconded the motion, and it was cordially adopted.

The CHAIRMAN: We, the Directors, thank you very warmly indeed for this expression of your confidence and goodwill. I have another motion to make; and that is to propose a vote of thanks to the officers and employees of the Company of all ranks. It would be very unjust to pass them over, seeing that so much depends upon them. With this vote I have to associate the name of Mr. Carpenter, our very able and very worthy Chief Engineer, and the name of Mr. Bush, our also very able and very worthy Secretary. These gentlemen represent the two departments of the works. Their hearts are in the work; they are thoroughly devoted to it; and they back up and support the Directors in the most loyal manner. Loyalty has not died out in England, as we can testify, with these gentlemen, and with those who are serving under them. I do not say that every employee is animated by the right spirit; but I do say that the great bulk and body of our employees are animated by the spirit of doing their best for the Company, and doing it heartily and well, with a due consideration of the interests of everybody else.

Mr. ROBERT MORTON seconded the resolution, which was carried unanimously.

Mr. CHARLES CARPENTER, in acknowledging the compliment, said the results of the year's working were as good a guide as they could have. During the last year, they had reached the highest point in respect of the amount of gas sold per ton of coal carbonized—the Company having actually sold 10,400 cubic feet of gas for every ton of coal, or about 1000 cubic feet more than were sold some seven years ago. This result had been effected with the lowest expenditure on record for carbonization—below 2s. per ton. The unaccounted-for gas was the measure of the care with which they looked over the more than 50 square miles of their district; and that item had not been lower for ten years. With regard to the question of purification, mentioned by Sir Fortescue Flannery, this was a subject to which, as they knew, Sir George Livesey had devoted many years of his life; and the result of the change had been that whereas for many years they were hampered by the disposal of many thousand tons of stinking, offensive material, last year nearly 5000 tons of sulphur extracted from the coal were sent down to the Company's residuals' works to be converted into sulphuric acid. In South London, where a good deal of money was being spent upon the construction of tramways, the streets were being opened, and the gas and water mains and telephone and electric pipes were being altered; and some two or three weeks previously, on a very dreary, drizzly day, he went over to see how the men were getting on. There were three different gangs at work. The first he came to were employed in road alterations, the second in altering water-pipes, and the third were the Company's own men. In the last gang there was not a single man with a straight back; and this he thought was very good indeed.

Mr. BUSH, in making acknowledgment for the secretarial staff, said they none of them liked deficits; and in the current half year they hoped the £9000 would be wiped off. The Company had been in almost exactly the same position with a deficit in December, and in the following half year they had cleared it off. In this respect he believed that history would repeat itself, for two reasons—one being that the Company had more favourable contracts for coke, and would be working with them during the whole of the half year; and the other because, under their present coal contracts they had a surplus amounting to between 80,000 and 100,000 tons. The report alluded to a slight falling off in the consumption of gas. This, no doubt, was due to the increasing employment of the incandescent light, which was being used by at least 80 per cent. of the ordinary consumers. Being curious to see the effect on the consumption, he had compared some 200 or 300 accounts of 1905, before people were using incandescent mantles, and of 1906, after they had adopted them; and he found that the reduction in the quantity of gas amounted to an average of upwards of 22 per cent.—the reductions ranging from 3 to 55 per cent. About 55 per cent. of the slot-meter consumers were using incandescent lights, the bulk of which had been fitted by themselves. The result had been a considerable reduction in the annual consumption of gas, representing 200 cubic feet per slot consumer; and if this were multiplied by 200,000 consumers they would arrive at a very large saving of gas. They were glad to know that this quantity had been saved. While these economical methods of lighting retarded consumption, they made consumers satisfied. In the long run, however, the Company would gain by this, because if the consumers were satisfied they would stick to the Company; and it was the Company's business, therefore, to satisfy the consumers.

The proceedings then closed.

COMMERCIAL GAS COMPANY.

The Ordinary Meeting of this Company was held last Thursday, at the Cannon Street Hotel, E.C.—Mr. W. G. BRADSHAW in the chair.

The SECRETARY (Mr. H. D. Ellis) read the notice convening the meeting; and the report of the Directors and the statement of accounts were taken as read.

TRADE PROSPERITY AND FINANCIAL INFLUENCE.

The CHAIRMAN, in moving the adoption of the report and accounts, said: Gentlemen, the half year with which the report and accounts now submitted to you deal was undoubtedly one of great prosperity and commercial and industrial activity in almost all parts of the world. The consequent demand for money to meet trade requirements led to high rates for money in London, which is regarded as the free market for gold to the world; and you will see these high rates reflected in our accounts in two different ways. We had intended at the end of the year to make an issue of stock to reduce the balance overdrawn on our capital account, which balance has reached rather larger proportions than we are accustomed to see. But a 6 per cent. Bank rate ruling in London did not provide the public generally with much spare cash with which to make investments; and therefore, as prudent men, we thought it wiser to defer issuing stock until circumstances were more favourable. It was obviously, I think, wiser to borrow temporarily from our bankers, though we had to pay a little more for the money, than to issue stock at a lower price, and so create a higher permanent charge upon the Company. The second result grows out of the first—that we have paid a little more than usual for interest for our temporary borrowing from the bank. Otherwise, I am afraid that the prosperity to which I have alluded did not greatly affect our Company, except that the activity in the iron and steel trades, coupled with the removal of the export duty upon coal, has given an excuse to the coal owners to raise their prices. As you know, our district in the East-end of London—with its large foreign population, and its very high rates—is the last to feel the benefit of any increase in prosperity in the country; and when prosperity declines, it is the first to suffer.

CAPITAL EXPENDITURE AND INCREASING BUSINESS.

Still we have had a very satisfactory half year; and we are able to report to you a steady growth in the business, and an increase in the strength of the position which the Company holds. If you will turn to the capital account, you will see we spent £15,309 under that head—a smaller sum than we have spent for a good many half years past. All of it was used for the provision of new services, stoves, and meters; and therefore became remunerative directly the money was spent. We have completed the equipment of the retort-house at Stepney with stoking machinery and regenerative furnaces; and it is gratifying to know that the machinery which is used for the extraction of the coke from the retorts was invented by a member of the Company's staff—Mr. Ludbrook—who was for many years our Manager at Poplar, and is now in the Engineer's office at Stepney.* I am glad to say that the machine is thoroughly satisfactory in all respects. So far as I can see, there is no large capital outlay before us in the immediate future, except for the provision of coin meters and stoves; and therefore, we can look with equanimity at the rather large balance by which the account is overdrawn and wait with patience for a favourable opportunity for issuing stock, because we know, if necessity demands it, we can issue stock at any time. The £15,000 we spent enabled us to add 3010 stoves and 4647 coin meters in the half year. During the whole year we added 6782 stoves and 9744 coin meters. Our coin meter consumers now number 54,968, or more than double the consumers on the ordinary meter system. Of course, these coin meters bring us a very large volume of business, which we could not have obtained in any other way, for very few of these people would have used gas through ordinary meters. And I am happy to say that the demand for these prepayment meters does not show any sign of being exhausted. We still have a large field in front of us for the supply of these coin meters, and for cooking and heating stoves to be used with them. One of the advantages of the coin meters is that—except in the case of robberies (which are not very numerous)—we do not make bad debts. Another thing is these consumers take our gas equally in summer and winter, and principally in the day time when the other demand is lightest. I think a third advantage is that these meters broaden our basis of trade; and they bring us a class of consumer who is not likely to desert gas for any more expensive illuminant or fuel. The disadvantages are—First, that the rental is more expensive to collect, and, secondly, that the meters involve a considerable capital outlay. I should like to give one or two figures regarding our capital account, which I think shows that it is in a very satisfactory position. I remember, when I became a Director of this Company in 1888, I was told (I think it was by Mr. Henry Jones's father) that gas experts considered that an outlay of £400 of capital per million cubic feet of gas sold was a very moderate and satisfactory figure. I have always kept this figure in my mind as a standard by which to work, and which must not be exceeded. Let us see how far we have kept to the standard. In 1906, we sold altogether 3127 million cubic feet of gas; and we had expended on works and mains £1,172,566. That works out to £374 per million cubic feet of gas sold—considerably within the standard which was laid down so long ago as 1888. But we have also spent capital in the provision of coin meters, services, and steamships—an outlay which was not dreamed of in 1888. This brings our capital outlay to £442 per million cubic feet of gas sold—a moderate figure which is being reduced every half year. I would also remind you that we obtain special remuneration for coin meters,

* An illustrated description of the machine referred to appears in our "Register of Patents" columns to-day.—ED. J.G.L.

to cover interest and depreciation; and I would like to say, as I have said before, that the possession of our steamers saves us a very considerable sum every year in the carriage of coal from the North into the Thames.

POINTS OF INTEREST FROM THE REVENUE ACCOUNT.

Now, turning to the revenue account. Last half year we sold 1596 million cubic feet of gas, compared with 1541 cubic feet in the corresponding half of 1905. That is an increase of 55 million cubic feet; but it cost us only £942 more to manufacture this increased amount of gas, though we paid 1s. per ton more for our coal, which is equivalent to £5521. The saving is due, first of all, to better working, which is a very satisfactory feature. We have also saved £2466 in purification, owing to the removal of the penalties for sulphur compounds; and the item for repair and maintenance is also £5166 less. With regard to these two items, I would point out to you that, whatever saving we effect, the consumers get by far the largest benefit from it. If we are able to save so much that we can reduce the price of gas by 1d. per 1000 cubic feet, it means for the consumers £6457 in a half year; but it only entitles the proprietors to an extra dividend of £1428—that is, the consumers get four-and-a-half times as much as the proprietors. Then as to the repairs, the item is less—not that we have starved the works in any way. But in the last few half years we have spent more than usual on the upkeep of the works; and it is no longer necessary to spend so much—thanks to the ability that Mr. Henry Jones brought to bear upon the construction of the works, and the way the Engineer (Mr. Stanley H. Jones) keeps them up. The works are indeed in thoroughly good order. The only other item on this side of the revenue account to which I must draw your attention is that of rent rates, and taxes. It amounts to £13,184, as against £10,615 in the corresponding half of last year, or an increase of £2569. Of the increase, £2507 is due to additional rates, and only £62 to increased rent. One satisfactory thing I can say about the item is this, that I hope it will be down next half year. Our assessment in Stepney will be down in April; and the rates in Poplar have been reduced, I think, from 12s. to 11s. 8d. in the pound. This is not a very great reduction; but we have to be thankful for very small mercies. Usually we do not get mercies in this respect at all. Turning to the other side of the account, the 55 million cubic feet of gas sold in excess of that of the corresponding half of 1905 produced an extra rental of £5269. I generally give you the percentage increase. It was 3½ per cent. on the sale of the corresponding half year. I think that is a very satisfactory figure, and I believe you will also consider it so when I tell you the South Metropolitan Company had the slight decrease of nearly ½ per cent. on their sales, and the Gaslight and Coke Company had an increase of only just over 1 per cent. Then the rental from meters and stoves gave us £3262 more, and residuals £889 more—a disappointing result, so far as residuals are concerned. The price of coke did not rise proportionately to the price of coal; and all through the half year the markets for tar and sulphate of ammonia were very weak. However, in spite of the fact that residuals did not give us the help we anticipated, our profit was £64,526, compared with £61,030 in the corresponding half of 1905—that was an increase of £3496. I think that is a satisfactory result.

NET REVENUE ACCOUNT.

Turning to the net revenue account, we brought forward £19,409 from the June half year. The interest on the debenture stock and temporary loans amounted to £9463. We recommend to you the payment of a dividend of £5 4s. per cent. on the 4 per cent. stock and £5 per cent. on the 3½ per cent. stock, which is the same rate of dividend as we have paid the last seven half years. It will absorb £51,525, and leave a balance of undivided profit of £22,947 to carry forward to the current half year.

THE OUTLOOK.

As to the future. I certainly shall not commit myself to anything in the form of prophecy. But I can state certain facts, and leave you to draw your own conclusions from them. So far in the current half year we have had a very satisfactory increase in the sale of gas, amounting to nearly 6 per cent.; and two-thirds of the coal used during the half year will cost us the same as the coal used during the half year just concluded. Therefore, it looks as if we ought to have a favourable result to present to you when we meet, at the termination of the half year, in August next. Beyond that, it is very difficult to see. As you know, the recent cold weather and the somewhat large foreign demand for coal has enabled coal owners to put up the price of their commodity. And I am afraid there is no doubt they intend to ask higher prices when we enter upon the negotiations for our contracts for the coming year. As you know, asking does not always mean getting; and you may be quite sure we shall use every endeavour to moderate the coalowners' demands. At any rate, we have clearly before us that it is in the interests of all the partners in this concern—shareholders, consumers, and employees alike—to keep the price of gas as low as possible; and we shall strain every nerve to avoid the necessity of having to raise it. But if, unfortunately, we have to pay more for coal, it may be that we shall have to put up the price of gas. I hope, however, it will not be so; but, of course, our duty as Directors is to hold the balance equally between the consumers and the proprietors, and to do everything we can to foster our trade, and so increase the prosperity of the Company. I hope, however, that when we come before you this time next year, we shall have as good a report to present as we have to-day.

The DEPUTY-CHAIRMAN (Mr. Walter Hunter), in seconding the motion, remarked that it did seem suicidal on the part of the country to let coal go out to foreign countries, and to have taken off the export duty.

The motion was unanimously carried.

Proposed by the CHAIRMAN, and seconded by the DEPUTY-CHAIRMAN, a dividend at the rate of £5 4s. per cent. per annum on the 4 per cent. stock, and of 5 per cent. on the 3½ per cent. stock, both less income-tax, was declared.

On the motion of the CHAIRMAN, seconded by the DEPUTY-CHAIRMAN, Sir John Colomb, K.C.M.G., and Mr. J. G. Pilcher were returned to their seats at the Board. In submitting the proposition, the Chairman observed that he thought the proprietors all knew the services Sir John had rendered to the country and to the Company, and that they would agree with him the Company could not have a better Director. Mr. Pilcher, too, had been with the Company a long time. Excepting himself (the Chairman), he was now almost the oldest member of the Board; and his colleagues much valued his presence.

Proposed by Mr. WILSHAW, and seconded by Mr. WILKINS, the retiring Auditor (Mr. S. W. Savage) was re-appointed.

Mr. ARTHUR HASTON moved a vote of thanks to the Chairman and Directors. Referring to the Chairman's remarks as to the possibility of an increase in the price of coal and gas, he said he hoped the other partners in the concern—the public—would bear in mind what the Company had done in the past, in carefully looking after their interests, by keeping the price of gas down to the lowest possible point.

Mr. M'NAUGHT seconded the motion, which was heartily agreed to.

THE PRICE OF COAL AND THE WORKMEN.

The CHAIRMAN, in reply, remarked that the Chairman of another Board of Directors of a London Company, in his report to the proprietors, alluded to the anxieties and difficulties of gas directors. The Board had anxieties and difficulties in front of them; but they were not insuperable, if they brought care and determination to bear upon them. Certainly they were not intolerable when they had the support and sympathy of the proprietors. Proceeding, the Chairman moved a vote of thanks to the officers, their staffs, and the employees. He said he did this in no formal spirit, because he felt they deserved the thanks of the proprietors, for so much depended upon the energy they brought to bear upon their work. He could give the testimony, which would be supported by all his colleagues, that the work of the Company was well done, and willingly done. He thought one fact which supported that testimony was this, that their men were sought for by other companies. But he thought that the Company could do as well for their staff as any other Company; and he was glad when they made up their minds that the Commercial Gas Company was good enough for them. He had much pleasure also in saying that their relationship with their workmen was all they could desire. He never heard of any difficulties at all on the works; and he was happy to say the work was well done by the men. The Directors did all they could for them; and they had their sympathy, and, when they needed it, their help. But if, unfortunately, they had to pay more for coal, they would need all the support the workmen could give them, in order to pull them out of the difficulty, by better work and increased economy. The Duke of Wellington, shortly before the Battle of Waterloo, was talking to a member of his staff at his hotel window in Brussels, when the officer said, "Well, Sir, I do not see how we can resist the coming of Napoleon." Just then a private soldier crossed the court yard; and the Duke, pointing to him, said "that is the article that will do it." Now if he (the Chairman) were asked, "How are we going to get over the difficulty of the increased price of coal?" he would point to their workmen in the carbonizing houses, and say, "There are the men who have to do it."

The DEPUTY-CHAIRMAN seconded the motion; and it was cordially agreed to.

Mr. ELLIS thanked the proprietors very heartily. It was, he said, gratifying to find that their services—such as they were, they were the best they could render—were so kindly received, and that the proprietors gave them credit for doing their best.

SUMMER AND WINTER INCREASES.

Mr. STANLEY H. JONES also cordially acknowledged the vote. He remarked that, if he might supplement one point in the Chairman's address about the gratifying increase in the consumption of gas, it would be to tell the proprietors the nature of it. It would interest them to know that the growth of the consumption of gas in the Company's district during the summer months of the year was double what it was in the winter months. The rate of increase in the quantity of gas sold was double from about April to September to what it was between October and March. This was a very gratifying thing, because it enabled them to keep the plant and machinery in full work, and tended to economy. With regard to the Chairman's remarks about the price of coal, he could assure the proprietors that the Company's staff and workmen were particularly interested there; because if there were an increase in the price of gas, it would reduce the profit-sharing bonus. So far as the staff and workmen were concerned, anything they could do to meet a possible increase in the price of coal they would do.

BRENTFORD GAS COMPANY.

Accretion of Business.—Criticism by Mr. Trewby of the Company's Carbonizing Results.

The Half-Yearly Ordinary General Meeting of this Company was held on Friday, at the Westminster Palace Hotel—Mr. HOWARD CHARLES WARD in the chair.

The SECRETARY (Mr. William Mann) read the notice convening the meeting, and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said the Directors had again to meet the proprietors with what he ventured to think, considering the circumstances of the half year—the influence of trade and atmospherical conditions—would be regarded as a very satisfactory financial statement. Weather had a great deal to do with the sale of gas; and during the six months ending with December, the average condition of the thermometer was 3 per cent. higher than had been the experience over a long period, and sometimes considerably more than 3 per cent. Nevertheless, the increase in the gas, meter, and stove receipts was £6506. If they took gas and meter rental alone, the increase was 3·23 per cent. In this connection, it was of interest to see how the business of the Company had grown. The ordinary consumers had increased from 29,392 in 1905 to 30,184 in 1906—an increase of 792, or 2·7 per cent.; while the prepayment consumers had increased from 30,277 to 35,139—an increase of 4862,

or 16 per cent. The number of ordinary stoves in use had increased from 21,287 to 23,420—an addition of 2133, or 10·02 per cent. The stoves installed in connection with the prepayment meter system had advanced from 20,922 to 23,374—an increase of 2452, or 11·7 per cent. It would interest the proprietors to learn that the inclination (upon which he had once before remarked) of the prepayment meters to show an average falling off in revenue had changed; and there was during the half year a decided increase in the consumption. This was a good thing, not only for the Company, but because it indicated, among other points, that the condition of the people who used the prepayment meters must generally be improving. The increases in connections showed what he thought might be claimed to be a tolerably satisfactory state of things. The half year had not been without anxiety for the Directors, owing to the attack made by a number of (he supposed they might be described as) speculators, who endeavoured to pass a measure in Parliament called the Outer Circle Railway Bill, which, had it received parliamentary assent, would have virtually destroyed useful parts of the Company's Southall station. It was, of course, necessary for the Directors to resist the Bill; and they did resist it to the utmost. By the aid of their Counsel and expert witnesses, the result was, in parliamentary parlance, that the preamble was declared "not proved." The sting of an attack of this kind was not all that remained. There were the expenses of the opposition; and the £1327 paid away for parliamentary charges in the half year was rather a large sum; and it would, had they not have had to defend their property, have gone to increasing the divisible profits for the half year. They had also, by reason of the doubtful blessings of municipal trading, and of the work of the County and Borough Councils, to pay an increased amount in rates of £1150. So that between parliamentary expenses and rates and taxes, they had an additional expenditure of £2478. The result of the half-year's business was that they had made a profit of £37,859; and they required for dividend £39,250. There was thus a deficit of £1391, which would be deducted from the undivided balance of £54,697. Regarding coal, this had risen very much in price; but their supply had not cost them much more. For the past half year, the cost had been 13s. 5·35d. per ton; and he was happy to say the Directors had had the foresight to cancel their former contract, and buy 200,000 tons of coal at an increased price, which virtually amounted to 14s. per ton. He believed the prices that were being quoted now were something like 16s. to 17s. per ton; and, therefore, they had undoubtedly made a good arrangement. The present contracts would certainly meet their needs until the end of 1907, if not longer.

Mr. TUCKETT asked what advance the 14s. was upon the previous contract.

The CHAIRMAN: 2s. 7d. Proceeding, he said the shareholders had no doubt observed that Sir George Livesey, in his address to the proprietors of the South Metropolitan Gas Company, had made some severe comments upon the increase that the coalowners were asking for gas coal. Regarding residuals, coke had given them an increase of £1928; but tar and ammoniacal liquor were rather less. Most of the other items in the accounts were very much on the usual level. After paying the dividend, they would have a balance of undivided profit of £53,305. The reserve fund now amounted to £31,354; and the insurance fund to £6426.

Mr. ULICK J. BURKE seconded the motion.

Mr. G. C. TREWBY said, as he had some criticisms to make, he ought perhaps to introduce himself to those who did not know him. He had been connected with gas all his working life; and as Chief Engineer to the Gaslight and Coke Company, he had introduced carburetted water-gas manufacture into this country. He was a shareholder in several gas companies; but his largest interest was in the Brentford Company. Therefore he had watched the progress of the Company with a very considerable amount of anxiety. For some years past, he had had an uncomfortable feeling that the quantity of gas derived from the coal had not been what it ought to have been. He would go back to the year 1890; and he found the Company then made 10,770 cubic feet of gas per ton of coal, and sold 10,173 cubic feet. This was before the introduction of carburetted water gas. Coming to the past half year, he had obtained the quantity of gas made from oil, and the number of gallons of oil used, and was therefore able to ascertain the number of cubic feet of oil gas and coal gas respectively made. He found that, instead of making as in 1890 10,770 cubic feet of gas per ton, there had been a drop to 10,275 cubic feet, and of gas sold to 9613 cubic feet, or a fall of 560 cubic feet per ton, or 5½ per cent. So that, while a great many of the companies supplying 14-candle gas had kept up their make per ton—in some cases to as much as over 11,000 cubic feet—this Company had shown a backward movement, notwithstanding that they had put up a carburetted water-gas plant for enrichment. He knew of three suburban companies, supplying 14-candle gas, measured by the No. 1 "London" argand burner, who in 1905 made an average of 11,226 cubic feet per ton, and who used 2 83 gallons of oil per 1000 cubic feet of gas.

Mr. R. J. NEVILLE NEVILLE: They have a better testing-burner.

Mr. TREWBY (continuing) said the Gaslight and Coke Company had to supply 16-candle power gas, as compared with the Brentford Company's 14 candles; and the respective results were as follows: The Gaslight and Coke Company made 10,846 cubic feet per ton of coal, and the Brentford 10,275 cubic feet; so that the Brentford Company made 571 cubic feet, or 5½ per cent., less per ton than the Gaslight and Coke Company. Take, too, the oil used. The Gaslight and Coke Company only used 2·9 gallons to enrich 1000 cubic feet of gas; the Brentford Company used 3·35 gallons, or 0·45 gallon (15½ per cent.) more. And the Brentford Company used 10·8 per cent. more enriching gas than the Gaslight and Coke Company, though making less gas per ton of coal. What did these figures all point to? With regard to the coal, they suggested one or other of these three things: First, the coal used was bad, and not worth the price paid for it; or, secondly, the carbonizing plant was bad, and not fitted to obtain the full results from the coal; or, thirdly, if the coal and plant were good, the plant was not being properly worked. Then with reference to the oil gas, which showed such a waste of material. It could not be said that the oil was bad, because the Company were using the same quality as the other companies; and therefore it resolved itself into either the apparatus being badly designed or improperly worked. To bring the matter to the basis of £ *s. d.*, what was the result compared with the Gaslight and Coke Company's working, which he had reason to believe was not yet the best that could be attained? The cost of the extra coal going to waste, working it out on the lines of the Gaslight and Coke Company's figures, was about £3000, without deducting residuals, or charging the cost of labour. That was to say, if they made the same quantity of gas from their coal as the Gaslight and Coke Company, they could save 4278 tons of coal. The cost of the extra oil used, amounting to 190,000 gallons, would amount, at 3d. per gallon, to (in round figures) £2400. This assumed that the Brentford Company were supplying their consumers with the same quality of gas as the Gaslight and Coke Company, which they knew was not the case, as the Brentford standard was 14 candles, and the Gaslight and Coke Company's 16 candles. Therefore, in order to institute a proper comparison, allowance must be made for this; and it was generally computed that the manufacturing cost of 2 candles was 1d. per 1000 cubic feet, and the selling price to the consumers was 2d. The 1d. per 1000 cubic feet equalled £5235; so that they arrived at a total amount, after allowing £2000 for residuals, of £8610. He was not in the least overstating the figure, but was rather understating it perhaps in allowing too much for residuals, and in not charging the cost of labour. But he thought he had said enough to show the Board and the proprietors what a serious matter this was from a financial point of view, more especially when the higher price of coal and, probably, oil was taken into consideration. He trusted, therefore, that the Board would without delay look into the matter with the view of remedying the state of things which existed, and stop the waste that was going on. He hoped, too, that the Board would take what he had said in a friendly spirit. He had no other object to serve than that the Company should be one of the best. They had also to take into consideration the fact that the parliamentary dividend had not been earned in the half year.

The CHAIRMAN pointed out that had it not been for the extraordinary parliamentary expenses and the extra charges for rates, the parliamentary dividend would have been more than earned.

Mr. TREWBY said he presumed they would continue to have to pay rates on the present scale.

The CHAIRMAN hoped that the ratepayers would see the folly of allowing wasteful expenditure, and that things would be changed.

Mr. TREWBY said his remarks applied to the waste disclosed by the carbonization returns. The Company were not now making so much gas per ton of coal, and yet they were using such an enormous quantity of oil. The matter was certainly one for explanation. One other remark he had to make was this. The Gaslight and Coke Company, in their accounts, put down the number of gallons of oil used each half year, and the quantity of gas made from it. Was there any objection to this being done in the case of the Brentford Company?

The CHAIRMAN: None whatever.

Mr. A. W. OKE supported the report. In the course of his remarks, he said that the Company's shares stood very well in the market. He could not help thinking the comparison made by the last speaker was somewhat unfortunate. He had compared a large Company with a much smaller one. He had given no information as to character and variety and prices of the coals used by the Gaslight and Coke Company, nor of the kind of oil they used, nor did he have regard to the differences in the testing-burners employed. However, he could not help thinking Mr. Trewby's experience in these matters might be usefully embodied in suggestions to the Directors, and if there was anything lacking in past working, they would do their best to remedy it. He could not, however, see that indifferent working was shown very largely in the results. The proprietors got good dividends, the price of gas was reasonable, and the Board had taken care to provide against the rise in coal (which had been increasing week by week) by securing supplies, at the price they had been paying, sufficient until the end of this year.

Mr. PFUNGST was quite sure there was something deficient in the management of the Company. The increased receipts were swallowed up by increased expenses. They had a magnificent field for carrying on their business, as was seen by the number of new houses and the continual increase in the sale of gas. But what was the use of it all if there was no net result from it? The parliamentary expenses only accounted for £500 more than in the corresponding half year. As to the rates, he presumed the Board had taken steps to appeal against their re-assessment in connection with the quinquennial revaluations. The Gaslight and Coke Company had obtained some reduction. The Governor also stated at the Gaslight meeting that the bye-products had realized more money. Apparently, the Brentford Gas Company had obtained less for theirs. He could not help feeling there was some want of business activity on the part of the Board or their officers.

Mr. J. CORBEN, prefacing his remarks by saying the proprietors had great regard for the Chairman and complete confidence in the Board, pointed out that they went on for some years contented with a 12 per cent. dividend, and there was not a sign of any dissent among them. Then the dividend rose to 12½ per cent. An adverse time now appeared to be commencing; and it was a time when there was no doubt a great deal of watchfulness and economy would be required on the part of the Board and their officers, to keep matters near about level. He was Chairman of a Company that could not be mentioned in comparison with the Brentford Company. Nevertheless, they worked on much the same lines. They used carburetted water gas, and nearly the same coals. He quite agreed with Mr. Trewby that they ought to have the quantity of oil used, and the production of gas from it, stated in the accounts. The Chairman had not touched upon the question of oil; but he (Mr. Corben) had looked upon it as a serious matter during the past eighteen months or two years. Oil had advanced in price very much; and in the case of the Company to which he referred, it had made as much difference to them as the advance that had taken place in the price of coal. Three years ago, they were buying oil at 2½d. a gallon; at the present time, they were paying 3d. He did not know what the Brentford Company were paying.

Mr. FRANK MORRIS: 3⅜d. delivered.

Mr. CORBEN (proceeding) said the increased price made a difference of from 2d. to 2½d. (he believed it was) per 1000 cubic feet. So far as he understood the matter, he agreed that the amount of oil used by the

Brentford Company per 1000 cubic feet of gas was extravagant; and he also agreed that the amount of gas made per ton of coal was not of the quantity which could compete with the production from modern systems of manufacture elsewhere. He was only making these remarks with the view of urging the Directors and their officers—the Engineer particularly—to pay very great attention to carbonizing expenses and results, and to endeavour to do something better than during the past twelve months. He was quite aware of the disparity in the size of the Gaslight and Coke Company and the Brentford. He admitted, too, that the Gaslight and Coke Company had an advantage in their modern machinery, and the vast quantity of coal they carbonized; but the Brentford Company had a corresponding advantage in illuminating power.

Mr. BURKE: We have a considerable disadvantage in our testing-burner.

Mr. NEVILLE: We have to use Letheby's 15-hole argand burner; and we are bound to supply what is practically a 16-candle gas.

Mr. MORRIS: If you like to go for the low standards, we could do 11,000 cubic feet per ton.

Mr. CORBEN: I hope you will try to alter that.

Mr. NEVILLE: The difficulty is if we go for the Carpenter burner, everything will have to go into the melting-pot.

Mr. MORRIS: We have applied to the Board of Trade; but there has not been any settlement yet.

Mr. TUCKETT asked whether, in view of the rise in the price of coal and oil, the Directors were anticipating any upward movement of residuals.

The CHAIRMAN said it was impossible to do that. But he should like to say, regarding the effect of atmospheric conditions on their business, that, owing to the cold weather since the beginning of the year, they had an increase of about 9 per cent. compared with the same time last year. They had also sold household coke at a much better price.

Mr. BURKE: It is not always a question as to the actual price you can charge for coke; sometimes, according to production and stocks, it is a question whether it is desirable to raise the price.

The CHAIRMAN also pointed out that the Board had put an extra £2000 to depreciation of meters.

Mr. MORRIS: You will not find any other Company of this size who have written off capital account £15,000 for depreciation out of the profits of the half year.

Mr. NEVILLE expressed the opinion that Mr. Trewby might have given the Board a little more time.

Mr. TREWBY said he sent a second letter, giving to the Chairman the figures three days before the meeting; and the Chairman had not seen fit to refer to them or to the subject.

The CHAIRMAN said he had not seen the figures, as he had been from home. He added that the capital used per 1000 cubic feet was regarded as a good indication of the working of a Company. This time last year it was 9s. 11d. per 1000 cubic feet; and it was 9s. 7d.

Mr. HUGHES expressed the opinion that it would have been better if the details of Mr. Trewby's criticism had not been made public.

Mr. PFUNGST asked whether any steps had been taken to fight the assessments.

The CHAIRMAN: The matter was put into the hands of skilled men, and the assessments were reduced.

The report having been adopted, dividends were declared at the rates per annum of 5 per cent. on the preference stock, 12½ per cent. on the consolidated stock, and 9½ per cent. on the new (1881) stock—all subject to income-tax. Succeeding, a resolution was passed re-electing to the Board Mr. Howard C. Ward, Mr. Ulick J. Burke, and Mr. R. J. Neville Neville. The retiring Auditors (Mr. Monier F. Monier-Williams and Mr. Alfred Bevis) were also re-appointed.

Mr. CORBEN moved a vote of thanks to the Chairman and Directors, and asked them to disabuse their minds that the criticism that day regarding the working was intended as a reflection upon them. They met there as fellow-proprietors; and it was an opportune time to ask questions and to comment upon results. The criticism had been made in a friendly way, with the desire to produce improvement.

Mr. TREWBY seconded the motion, which was agreed to.

The CHAIRMAN, in acknowledging the vote, said he regretted there had been any differences about these matters. But he thought the questions raised were scientific ones, which should be discussed with the officers of the Company.

The proceedings, which had extended to an unprecedented length for the Company, then terminated.

WANDSWORTH AND PUTNEY GAS COMPANY.

The Half-Yearly Meeting of this Company was held last Tuesday, at the Company's Office, Fairfield Street, Wandsworth—Mr. H. E. JONES in the chair.

The SECRETARY (Mr. Charles W. Braine) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN said he had great pleasure in moving the adoption of the report and accounts, and in dealing with their main features so as, if he could, to assist the proprietors' appreciation of the condition of the Company. They had sold for the first time in their history a quantity of gas which made the sale for the whole year 12 million cubic feet over 1000 millions, which was a stage in their record. Every million cubic feet of gas represented 100 tons of coal; and, therefore, 1012 million cubic feet of gas meant that they had used the equivalent of 101,200 tons of coal. In the half year, the extra sale had been equal to 4·05 per cent., which was rather a record among neighbouring companies, because of the fine autumn. Every one of the neighbouring gas companies whose accounts were to hand—the Brentford, his own old Company (the Commercial), the Gaslight and Coke Company, and the South Metropolitan Company—showed that, in respect of the percentage increase in the consumption of gas, the Wandsworth Company had during the past six months topped the record. It was not his practice to quote figures of other companies, especially of those who had not yet held meetings, and therefore he only told the proprietors this in general terms. Now they had also added to their consumers very nearly 1000 in the half year—928 to be exact, of whom 243 were ordinary consumers, and 685 (or as nearly as possible three times the number of ordinary ones) were prepayment consumers. The Company had also increased the number of stoves let out by 972, which showed that not only did all the new consumers take stoves, but some of the older customers were converted to their use. The proprietors would have noticed that the profit shown on the face of the accounts was rather less than last year. In the corresponding period of 1905, it was £13,075; and on this occasion, it was £12,563. The Board were not disheartened about this, because it would be remembered that they had the courage to reduce the price of gas last year by 2d. per 1000 cubic feet, and their Secretary had told him that this meant on the sale of gas in the half year no less a concession than £3616. It would be seen at once that if they had kept the price of gas up, this £3616 must have meant a large additional profit. They could not surrender this sum to the consumer unless they made some great improvement in manufacture and got a considerable development in their business; and therefore it was a great satisfaction to him to say that the concession of £3616 had only resulted in a net loss of profit of about £512. What did the £3616 mean, when it came to be compared with the extra dividend paid for the past year, because the Board had manfully faced the privilege granted by the statute of raising the dividend when they lowered the price of gas. Therefore the dividend which would be paid to the proprietors that day would be calculated at the full statutory rate, corresponding with the reduced price of gas. But the amount that would be distributed among the proprietors was only £422, against the £3616 that the consumers would get; so that out of any improvement, any saving or economy the Company could effect, the consumers took nine parts and the proprietors only one. The reason why the proprietors' proportion was so small in this Company was because of the great economy with which their capital had been spent; and the dividend was a comparatively small charge upon the gas—being about 6½d., whereas in many companies, it was as much as 1s. 6d. The capital being small, it took a small amount of extra profit to give the proprietors the additional dividend due to the reduction in the price of gas. Therefore, under similar circumstances, where low gas capital accounts were well administered, the proprietors' share in the "plunder" (if he might so call it) was always minute compared with the consumers' share. The proprietors were aware the Company professed to sell gas at 2s. per 1000 cubic feet; but owing to the fact that they had a large number of manufacturers in the district who got a reduction, the Company did not realize 2s. per 1000 cubic feet. When they allowed for discount, they obtained something like 1s. 11d. per 1000 cubic feet. So that he thought the proprietors would be satisfied that their Company were supplying an article that was manufactured about as reasonably as in the case of any company in London or the south of England. In arriving at this profit, he might say they had spent a little more on coal and oil—a mere fraction worked out to per 1000 cubic feet of gas made. In this connection, it might interest the proprietors to know that the Company now brought their coal by steamer direct from Newcastle, and unloaded it in the river opposite the works, where they had floating stores. As to the residuals, they had realized a rather larger sum from coke; and the other residuals were about the same, except that sulphate had not been quite so good. The other charges, too, were on much the same footing as in the corresponding half year of 1905; and, in fact, when a Company had been worked up to what the officers and the Directors called "agony point," there was not much room for variation in the charges, because they had largely exhausted their opportunities for improvements. The proprietors had therefore a strong whip hand on their officers and Directors in the knowledge that any extravagance upon such small figures would leave no margin, and the proprietors would at once suffer in their dividends. The total cost of gas, after deducting residuals, was just under 23d. as against 24½d. in the corresponding period of the previous year. The receipts from gas, owing to the reduction, had come down from 31d. to 29d. But this included the rental of meters, stoves, and coin fittings; so that the actual cost of gas was under 2s. This left the Company a profit of rather less than 6½d., as against 7d. in the corresponding period of 1905. The consequence was that on this occasion they had not quite earned their statutory dividend (which required £13,183) by the sum of £619, which was, roughly, equal to ½d. But the Directors did not hesitate to recommend this dividend, because they carried forward a small balance from previous years. He ventured to think that, in a half year in which they gave up to their consumers nearly £4000, or nearly £8000 in the year, the proprietors would consider it not undeserving of their satisfaction that the Company had actually earned within close upon £600 of the dividend which, under the statute, was the very largest they could possibly offer the proprietors. He could assure them that, on all points, their affairs were vigilantly watched by the Directors and officials alike.

The DEPUTY-CHAIRMAN (Mr. T. A. Ives Howell) seconded the motion, which was unanimously carried.

The CHAIRMAN next moved that dividends be declared at the following rates per annum: On the "A" consolidated stock 8 per cent., on the "B" consolidated stock £6 10s. per cent., and on the ordinary "C" stock £5 12s. per cent. It would be remembered that, under the consolidation and conversion of the capital, the proprietors' holdings duplicated their original amounts of stocks, and that the dividends now proposed were exactly those due to the proprietors under the Act, in view of the last reduction in the price of gas.

The DEPUTY-CHAIRMAN seconded the motion, which was agreed to.

Proposed by the CHAIRMAN, and seconded by Mr. H. S. FREEMAN, the retiring Directors (Mr. E. R. Ransome and Mr. J. Bromley Howell) were unanimously re-elected; and both gentlemen duly acknowledged the continued confidence of the proprietors. It was mentioned by the Chairman that Mr. Ransome had been a Director 36 years.

Proposed by Mr. J. TURTON WRIGHT, Mr. John Hennell was replaced in the auditorship.

Moved by Mr. J. C. BADCOCK, C.B., and seconded by Mr. J. TURTON WRIGHT, a hearty vote of thanks was passed to the Chairman and Directors and the officers, for the satisfactory way in which the Company's business had been managed during the half year.

The CHAIRMAN responded; and, referring to the officers, he said that

no company could have a better Secretary than Mr. Braine, and their Engineer (Mr. H. O. Carr) would not be left behind even by the Secretary in winning the praise of the Directors and proprietors in years to come.

Mr. BRAINE and Mr. CARR both expressed their acknowledgments on behalf of themselves, their staffs, and the workmen.

The proceedings then terminated.

CROYDON GAS COMPANY.

Half-Yearly Report and Accounts.

In the report to be submitted by the Directors of this Company at the ordinary half-yearly meeting next Friday, they state that the sales of gas during the six months ending Dec. 31 last show an increase of 6·67 per cent. over those in the corresponding period of 1905; while the number of consumers and of stoves on hire rose by 1014 and 789 respectively. During the half year, the equipment of the new stove and meter repairing shops at Waddon was completed; and considerable progress has been made with the erection of an entirely new section of scrubbing, washing, and purifying plant. The new show-room and the additions to the chief offices have also been completed. The accounts accompanying the report show that the balance of net revenue available for distribution is £24,838; and the Directors recommend dividends at the rates of 14½, 11½, 10¾, 10, and 5 per cent. per annum (all less income-tax) on the several classes of stock. The payment of these will absorb £20,378; leaving a balance of £4460 to be carried forward.

The working statements show that 38,980 tons of coal as well as 471,529 gallons of oil were employed in the production of 621,842,700 cubic feet of gas, of which 568,699,200 cubic feet were sold and 575,844,500 cubic feet were accounted for. The estimated quantities of residuals produced were: Coke, 23,388 tons; breeze, 4858 tons; tar, 501,742 gallons; ammoniacal liquor, 943,156 gallons—the quantity of sulphate made being 378 tons.

SOUTH SUBURBAN GAS COMPANY.

Half-Yearly Report and Accounts.

The following is the report on the working of the Company in the half year ending Dec. 31, which will be presented to the proprietors next Friday.

The reduction in the price of gas from June last, concurrent as it was with a considerable increase in the cost of coal, has had a result that was not unexpected—viz., a deficiency on the working of the half year of £1884 18s. 6d., as shown in the net revenue account; £3711 2s. 11d. is brought forward, and £1826 4s. 5d. will be carried forward to the next half year.

Under these circumstances, and with the possibility of a further increase in the price of coal, the Directors do not recommend the payment of the full dividend of 5¾, or £5 13s. 4d., per cent. to which the shareholders are entitled under the sliding-scale when gas is sold at 2s. 5d. per 1000 cubic feet. They have, however, no hesitation in recommending the same dividend as the last—viz., at the rate of 5½ per cent. per annum.

Reverting to the question of coal, there is a report that a body of Midland gas coal owners agreed in conference to put up the price of gas coal 2s. 6d. per ton. The only proper answer to this action is for the buyers of that coal (it is to be hoped there will be none in the market for some time) to refuse to take it at such an advance. The suggested increase of 2s. 6d. per ton on coal would mean 3d. per 1000 cubic feet rise in the price of gas. To raise the price of gas would be very injurious to the gas industry; and the Directors will certainly do everything in their power to avoid such a misfortune.

The new conditions under which the Company supply gas, which they have been four years in obtaining piecemeal, have now been in full operation since June last. They appear to have given general satisfaction; neither consumers nor local authorities, nor the inhabitants of the neighbourhood of the gas-works, making any complaints of the altered conditions. This is the ultimate justification of the determination of the Directors to carry the fight to a finish, though it needed four consecutive applications to Parliament, and cost the Company quite £10,000, and, according to a statement in the "JOURNAL OF GAS LIGHTING" of Jan. 22, cost the Local Authorities £2662 in futile and mischievous opposition—a sheer waste of some £13,000, proved by the fact that Parliament has actually granted to the Company somewhat more than they originally asked. The Directors are glad to add that it was the fairness of the Beckenham Local Authorities that materially helped the final settlement, for without their action it is possible there would have been another Bill this year. If so, the price of gas would not have been reduced, and the present satisfactory relations with all the Local Authorities would have been only a matter of hope.

It is satisfactory to note that the consumers take a practical interest in the affairs of the Company, as, since the last half-yearly meeting, £30,000 of the ordinary 5 per cent. stock was offered to them, at £124 per cent., and the whole of this amount has been taken up.

The working in the manufacturing part, under Mr. Shoubridge, and in the office and secretarial department, under Mr. Ohren, efficiently and willingly aided as they have been by the heads of departments and the staff generally, has been constantly improving; and there is no doubt those devoted officers and their assistants would say they hope still to improve the working of the Company generally. They would also join the Directors in saying that their efforts are most heartily and loyally supported by the great body of workmen of all ranks and classes, who, being shareholders, both officers and workmen, take a real interest as proprietors in the Company with which no other interest can be compared.

Two Directors (Sir George Livesey and Mr. Charles Hunt) and one Auditor (Mr. Thomas Guyatt) retire from office at this meeting. They are all eligible, and offer themselves for re-election.

The accounts accompanying the report show that the revenue from the sale of gas in the past half year was £79,814; from meter and stove rents, £5968; and from residuals, £26,536. The total receipts were £112,374. The expenditure on the manufacture of gas was £69,770; on distribution, £10,867; and on management, £4945—the total expenses amounting to £93,461. The balance carried to the net revenue account is £18,913; and the amount applicable for dividend, £19,413. The working statements show that 66,089 tons of coal were carbonized in the half year, and that 733,547,000 cubic feet of gas were made, of which 660,760,000 cubic feet were sold and 670,584,000 cubic feet accounted for. The residuals produced were: Coke, 793,068 cwt.; breeze, 15,746 yards; tar, 688,423 gallons; and ammoniacal liquor, 15,331 butts—the quantity of sulphate made being 619 tons.

TOTTENHAM AND EDMONTON GAS COMPANY.

Half-Yearly Report and Accounts.

The report which the Directors of the Tottenham Company will present to the shareholders on Saturday opens with the gratifying statement that the growth of business continues to be satisfactory. The sales of gas show an increase, in the six months ending December last, over the corresponding period of 1905, of 54,749,040 cubic feet, or 9·8 per cent.; the number of consumers has been augmented by 4370; and 1629 additional cooking-stoves are in use. The Directors are of opinion that the position of the Company's finances justifies a further reduction in the price of gas; and they have accordingly decided to lower it 2d. per 1000 cubic feet from the reading of the indices of the meters at the last Christmas quarter—making it 2s. 6d. The net profit for the half year, after providing for interest charges and carrying £1000 to the insurance fund, is £15,172. Adding £19,088 the balance previously accumulated in the net revenue account, the sum available for distribution is £34,260. The Directors recommend the payment of dividends at the rates of 6½ per cent. per annum on the "A" stock, and 5 per cent. on the "B" stock, which will absorb £13,007, and leave £21,253 to be carried forward. The Directors record that Mr. James Randall has resigned his position as Secretary of the Company, after 54 years of service; and, under the authority given in the Act of last year, they invited him to join the Board. The proprietors will be asked to sanction a retiring annuity to Mr. Randall, to confirm his election as a Director, and to add to the allowance to the Directors accordingly. The Assistant-Secretary (Mr. E. Topley) has been appointed Secretary; and a resolution will be submitted to the proprietors fixing his remuneration.

The accounts accompanying the report show that a sum of £26,370 was expended for capital purposes in the six months to which they relate; £11,611 of it being for new land which the Company had been authorized to acquire. There is a debit balance of £12,185 on this account; but the shareholders are to be asked to authorize the Directors to exercise certain powers to raise capital conferred by the Act of last year. The revenue from the sale of gas amounted to £81,951; meter and stove rents and the maintenance of incandescent mantles produced £10,999; residuals realized £12,892; and the total revenue amounted to £105,855. The expenditure on the manufacture of gas was £56,359; on distribution, £16,986; and on management, £4205—the total expenses being £86,671. The balance carried to the profit and loss account is consequently £19,184. The working statements show that 31,319 tons of coal and 706,723 gallons of enriching oils were employed in the production of 665,931,000 cubic feet of gas, of which 613,152,000 cubic feet were sold and 623,606,000 cubic feet accounted for. The estimated quantities of residuals produced were: Coke, 18,791 tons; breeze, 2980½ chaldrons; tar, 386,450 gallons; and ammoniacal liquor, 8700 butts—the make of sulphate of ammonia being 219 tons 7 cwt.

FURTHER REDUCTION IN PRICE AT SHEFFIELD.

The Directors of the Sheffield United Gaslight Company announce, with considerable satisfaction, that they have decided to reduce the price of gas by 1d. per 1000 cubic feet from the dates of the reading of the meter-indices for the March accounts. This reduction amounts to about 6 per cent. to the ordinary consumers, and 8 per cent. on the gas supplied to the Corporation for public lighting and to users of gas-engines. The charges will then be 1s. 4d., 1s. 2d., and 1s. per 1000 cubic feet, according to consumption; and 1s. per 1000 cubic feet for engines. The charge for the public lamps from the 1st of April will be at the rate of 1s. per 1000 cubic feet. The average price at which gas has been supplied by the Company during the past half year is 1s. 4·06d. per 1000 cubic feet. In addition to this gratifying announcement, the report to be submitted at the meeting on the 11th prox. states that the fact that the advantage of a cheap supply of gas is appreciated by the consumers is shown by its increased use for all the purposes for which it is pre-eminently suited—lighting, cooking, heating, and also for power. The additional quantity sold during the six months to Dec. 31 was 84,424,000 cubic feet, or 5·64 per cent. There is a profit on the half-year's working of £10,603 more than is required to pay the dividends.

Increased Sale of Gas at St. Austell.—A very successful year's trading is recorded in the annual report of the St. Austell Gas Company. There was an increase of 64 in the number of consumers, and of 6½ per cent. in the sale of gas. The Directors recommend the payment of a dividend of 8½ per cent., and remark that this is a subject for congratulation, in view of the advance in the price of metals and the increased competition with the Company. The revenue of the year was £5106, and the expenditure £4687.

PROVINCIAL GAS COMPANIES.

Extended Operations at Derby.

The Directors of the Derby Gas Company had an excellent report to present to the shareholders at the annual general meeting last Friday. The profit on the past year's working amounted to £30,006, and the gross profit was £30,047. After deducting the interim dividend and the interest on the debenture stock and deposits, there was left a balance of £17,626; and this, with the balance of £9777 brought forward, gave a total sum of £27,403 available for distribution. The Directors recommended the payment of the standard dividend on the consolidated stock at the rate of 5 per cent. per annum for the half year ending Dec. 31, with an additional ½ per cent. for the whole year, making 5½ per cent. The Directors stated that the purchase of the undertakings of the Spondon, Ockbrook, and Borrowash Gas Company, Limited, and the Mickleover and Etwall Gas Company, Limited, had been completed, and trunk mains were being laid to enable the new districts to be supplied with gas direct from the Derby works. There had been a very satisfactory increase in the sale of gas; and the Directors, in order to further extend and encourage its use, had made considerable reductions in their scale of charges from the last June quarter. In moving the adoption of the report, the Chairman (Colonel Gascoyne, J.P.) remarked that though this year was the Centenary of Gas Lighting in London, and the Derby Gas Company could not boast quite 100 years of existence, he might congratulate the proprietors upon 87 years of varying fortunes, but latterly of continued prosperity. The report before them contained the announcement that the neighbouring small works of the Etwall and Spondon Gas Companies had been purchased; and they were incorporated with their own on the 1st of January. Towards the close of last year, the Directors entered into a contract, extending over a term of years, to supply the Midland Railway Company with a large quantity of gas in bulk. Turning to the accounts, the Chairman said one of the items of expenditure on capital had been £2843 for new mains and services, the bulk of which was for the new high-pressure main to Mickleover, it being their intention shortly to close the Etwall works, and supply all that district from the Derby works. During the year they had laid 4 miles 171 yards of new mains, besides relaying 333 yards of larger mains in substitution of inadequate ones. New meters had cost £2829, and new gas-fires and cooking-stoves £4810; but from this must be deducted the depreciation on all those in present use, leaving the balance to be charged to capital. It might be interesting to mention that there were no less than 11,145 gas cooking-stoves and fires out on hire or sold to customers, all supplied and fixed by the Company, besides a considerable number which had been bought privately and fixed by local gas-fitters. The total expenditure for capital purposes was £7888. Then, of course, the additional sum of £18,100, being the purchase price of the two new Companies, came into capital account in the balance-sheet; but it was all taken in stock of their Company. The chief item on the expenditure side of the revenue account was always coal. For this they had paid £27,174; being a decrease of £350 from the previous year, due to their having bought at a somewhat cheaper price. The number of tons carbonized was practically the same—roughly speaking, 60,000 tons. The expenses of carbonizing in 1905 were £9404; but last year, notwithstanding that there was an increase of 4 per cent. in the quantity of gas sold, the carbonizing had cost only £8973—a saving of £431. This, added to the saving on the coal, gave a total advantage of nearly £800, though they had sold so much more gas. He would also say that in 1905 the quantity of gas sold per ton of coal used was 10,000 cubic feet, whereas during 1906 it was 10,300 cubic feet. All these facts indicated the superiority of modern methods of working and the value of labour-saving machinery, which had been introduced by their Engineer (Mr. J. Ferguson Bell, M.Inst.C.E.), with whose valuable advice and co-operation the Directors hoped to effect still further economies. Having dealt with other items of expenditure, the Chairman explained that the sum for repairing and renewing meters was a considerable increase on 1905, due to a great number of the ordinary kind being replaced by prepayment meters, of which they had now upwards of 11,000 in use. On the receipts side of the revenue account, the quantity of gas sold during the year was shown to be 609½ million cubic feet, which was an increase of 24 millions. The revenue from the sale of gas was £75,513; being an increase of £2654, notwithstanding the substantial concessions in price which came into operation on the 1st of July last. In the large increase in the gas sold, the development of gas-engines played a most important part. With regard to residuals, the prices obtained for them had, on the whole, been lower than in 1905; but, fortunately, by the economies effected in manufacture, the actual returns had been increased. The total receipts amounted to £100,731; and the profit on the year was £30,006, or £1000 less than it was for 1905, owing to the large expenditure to which attention had been drawn. The reserve fund stood at £30,000; and it was automatically increasing by the addition of its own interest. In conclusion, the Chairman said he thought the Company never stood in a sounder financial position; and he believed the shareholders might look forward with confidence to the future. Alderman Newbold, in seconding the motion, pointed out that this was the first occasion in the annals of the Company when the annual revenue had reached £100,000; and he said this result was achieved in face of the competition they had to encounter from the electric light—a competition which, however, they did not fear, because they were firmly convinced that they could supply the public with a superior light at much less cost. The motion was carried. The dividend recommended having been declared, the retiring Directors were re-elected. One was Sir Henry Bemrose, who, in acknowledging the continued confidence of the proprietors, said the Company had a body of officers second to none. They claimed to be progressives—not on London County Council lines—but on Derby Gas Company lines. The whole of the Board took extreme pleasure in being able to manage the affairs of the Company to the satisfaction and benefit of the town. The meeting voted an increase in the fees of the Directors, and their thanks were accorded to the Chairman, his colleagues on the Board, the Engineer, Secretary (Mr. H. Bullivant), and staff, and acknowledged by the Chairman and the Engineer.

Alluding to the price of coal, Mr. Bell mentioned that for a number of years coal had been too cheap, and the collieries had not obtained sufficient for their product. Now, he was afraid, there was a tendency to go to the other extreme. A few years ago the Company used to be satisfied with 50 per cent. on the value of the coal as the return for residual products; but last year they obtained almost 80 per cent. of its cost.

Breaking Records at Scarborough.

The report and accounts for the year ending Dec. 31, which were presented at the meeting of the Scarborough Gas Company on the 9th inst., were of a highly satisfactory character. There was an increase of about 9½ million cubic feet in the quantity of gas sold; and although the price was reduced in April by 1d. per 1000 cubic feet in the town and 3d. per 1000 cubic feet in Scalby, the revenue was slightly more than in 1905. The accounts showed a sum of £8845 available for distribution; and the Directors recommended the payment of the usual dividends, which would leave £2257 to be carried forward. The Chairman (Mr. B. Fowler, J.P.), in moving the adoption of the report, said the gas sold last year amounted to 300 million cubic feet, the number of consumers exceeded 10,000, and the price of gas stood at the very low figure of 2s. 6½d. per 1000 cubic feet net. These were records in the history of the Company; and the fact that all the public lamps were now fitted with incandescent burners made the year 1906 a memorable one. All the lamps of the old pattern in the main thoroughfares had been replaced by others of the most modern type; and he felt he was safe in saying that the street lighting of Scarborough would compare favourably with that of any town in the kingdom. Incandescent lighting continued to spread among the consumers at a rapid rate, as during the past two years the Company had sold nearly 2000 incandescent burners and about 20,000 mantles; and beyond these no doubt a large number had been disposed of by local plumbers and ironmongers. The report was adopted without discussion. The dividends recommended having been declared, thanks were accorded to the Directors, officials, and staff for their services. The Manager and Secretary (Mr. A. Allan) acknowledged the vote on behalf of the staff, and the ordinary business terminated. The meeting was then made special, and the shareholders' approval was given to the promotion by the Company, in conjunction with others, of a Bill to remove the restrictions in respect of sulphur compounds other than sulphuretted hydrogen.

Satisfactory Business at Wakefield.

Presiding at the 120th ordinary general meeting of the Wakefield Gaslight Company, Dr. W. A. Statter, J.P., referred to the satisfactory nature of the balance-sheet, and pointed out that the dividend had been earned, and a balance carried forward. He said the revenue account showed a larger expenditure on the manufacture of gas, chiefly under the head of coals; there being an increase in the sale of gas to the extent of 2,316,673 cubic feet, or 1·91 per cent., during the half year to Dec. 31. The expenditure on the other items was normal. The total receipts (£22,020) showed a gratifying increase, amounting to £435. The report and accounts were adopted; and it was agreed that, after paying the prescribed dividend on the 4½ per cent. preference stock, the following dividends should be paid, less income-tax: 5¾ per cent. on the £25 and the £5 shares, 4½ per cent. on the £5 "B 5th" shares, and 4¼ per cent. on the £10 shares—the balance to be carried to the next account. Hearty votes of thanks were passed to the Chairman and Directors for the satisfactory manner in which they had conducted the Company's business during the half year, and to the officers and workmen generally for their services—coupled with the names of Mr. H. Townsend, the Engineer, and Mr. W. H. Parker, the Secretary.

COLNE VALLEY WATER BILL.

Progress of the Company.

At the close of the half-yearly meeting of the Colne Valley Water Company—which was held last Tuesday at the Charing Cross Hotel—an extraordinary meeting was held, to consider the Bill which the Company are promoting to enable them to raise fresh capital, and for other purposes. The Chairman (Mr. C. E. Keyser), in moving that the Bill be approved, said that it was necessary for the Company to have some further capital, if they were to keep pace with the development of the district. They were desirous of obtaining power to raise £240,000 of ordinary stock and £60,000 of debenture stock. This was an approximate estimate of the Company's Engineers of the amount that might be required during the next twenty years. They had spent over £150,000 within the past ten years; so that the estimate was likely to prove correct, if the district increased in the future at the same rate as it had been doing. Power was sought under the Bill to pay pensions to old officers and servants; but any grants of this sort would be sanctioned by the shareholders, and would not be left in the hands of the Directors. There was also a clause in the usual form which was to be found in similar Bills of water and other companies, to enable the Company to build cottages, &c., for their workmen, so that outlying stores, and things of that kind, might be properly looked after. The opposition to the Bill was mainly with the object of trying to obtain a reduction in the water-rates. The shareholders, however, had a right to be paid arrears of dividend before the charges could be lowered; and large sums had been invested in the Company on the faith of these back-dividends. People must remember that the Company had not always been earning 9½ per cent. They began in a very small way; and their charges were based on the same scale as those of the London Companies, though there were miles and miles of pipes that hardly had to carry any water at all. It seemed to him wrong that the public authorities should complain of the charges; and the Company could not consent to forego the advantages which they obtained under their Acts. In time, however—when the maximum dividends were paid, and the question of back-dividends had been

dealt with—a very substantial concession would doubtless be made to the consumers.

One or two shareholders suggested that if the Directors would arrange a conference with representatives of the Councils concerned over the area of supply, there would be a possibility of some arrangement being come to, Failing this, there would be a large expenditure of the ratepayers' and the shareholders' money. The Chairman said that, of course, the Directors would be only too pleased to come to some arrangement with the Local Authorities, if such a thing were possible; but they had a duty to perform to the shareholders. The time could not now be very far distant when, by automatic action, the consumers would benefit by the Company's prosperity. The motion approving the Bill was carried.

In moving the adoption of the report and accounts at the ordinary meeting, the Chairman said he hoped the shareholders felt that the progress of the Company during the past six months had been as satisfactory as for the last few years. The total amount of the water-rates for the half year to Dec. 31 was £20,147, as compared with £18,295 for the corresponding six months of 1905. This was an increase in the one half year over the other of £1851; and if to this was added the increase in the first half of 1906 over the same period of 1905 (£1138), there was shown a total increase for the past year of £2990. The number of new supplies added during the past six months was 504, estimated to yield an annual water-rental of £1534, and making a total for the year of 939 supplies, and an estimated rental of £2640. The total number of supplies now amounted to about 15,000; while the population served was something like 82,000. The profit for the half year amounted to £13,631; and the Directors had added £2000 to the contingency fund account, instead of £1000, as in previous half years. Out pay out of this account in respect of the old horizontal engines. Out of the balance available, it was proposed to pay dividends at the rate of 9½ per cent. on the 10 per cent. maximum shares and 7 per cent. on the 7 per cent. maximum shares. This was ½ per cent. more on the former class of shares than was paid for the previous half year. Though a dividend of 9½ per cent. might appear high, it must be borne in mind that the original shares were issued very many years ago; and the average dividend paid on them had only been 3¼ per cent. The original shareholders had to wait nine years before getting any dividend at all, and eighteen years before they obtained more than 3 per cent., and the original Directors had to wait a good deal longer than this before they received any fees, because they declined to take anything until a fair dividend was being paid. The total quantity of water pumped in the past half year was 475 million gallons, as compared with 446 million gallons in the same period of 1905. The consumption per head per diem was the same in the two half years—namely, 25 gallons. With regard to the works, he might say that the new pumping-engine was practically completed; and it was now being worked by the Contractors for three months. The Consulting Engineers (Messrs. John Taylor, Sons, and Santo Crimp) were sanguine that the duty obtained from it would be very satisfactory. The Directors had entered into a contract for sinking a well on the Eastbury Road land, and for laying a pumping-main therefrom to the softening works at Bushey. To provide the necessary money for this work, and for the further extension of mains, &c., the Directors had decided to issue the remainder of the debenture stock (£12,500) authorized by the 1873 Act. The machinery and plant had been maintained in a thorough state of efficiency; and the reports of analyses of the water during the past half year had been entirely satisfactory. He thought that at any rate the district had the best water that could be found throughout England.

The motion was seconded by Mr. A. Helsham-Jones, the Vice-Chairman; and a long discussion ensued. In answer to questions, the Chairman said the contingency fund was not the same as the reserve fund. It was really to provide for replacements which should be paid for out of revenue. The advantage of it was that it enabled any heavy payment to be spread over a period. There was a reserve fund in addition to the contingency fund. One shareholder remarked that, if the Company went to Parliament now, they would possibly have to sacrifice part, if not the whole, of the back-dividends; and he suggested therefore that it would be better to defer the Bill until something had been paid on account of the arrears, in which case he thought Parliament would be more likely to favourably regard the question. The Chairman, however, pointed out that the Bill was purely a finance one, and that the Company had come to the end of their tether, with the exception of the debenture stock to which he had referred.

The report was adopted, the dividends recommended were declared, and the retiring Directors and Auditor were re-elected.

Bacup Water-Works Scheme.—Mr. James Diggle, reporting to the Bacup Town Council on the new Cowpe reservoir works, states that, by arrangement, the time for the completion of the works has been fixed for March, 1908, and there is no reason why they should not be easily finished by then. He thinks that the contract works should be carried out for the amount of the original tender, *plus* the parliamentary estimate for deepening the trenches (say £109,000). It is proposed to proceed with the laying of mains next month. The cost of the transfer of the old undertaking, &c., was £1203; that of the works and plant £48,378; filter-beds and settling-grounds, £11,781; Cowpe scheme and works, £131,822—making, with the parliamentary costs, a total expenditure to date of £197,672.

Gas-Fitters and Municipal Trading.—Speaking at the second annual dinner of the Birmingham and District Master Gas-Fitters' Association last Wednesday, Mr. J. Thacker remarked that the Association was formed with definite objects. These objects had not yet been achieved; but they were pegging away to secure them. The Association met the gas committee with regard to municipal trading; but they were not successful. They thought, however, that if they persevered they would secure concessions which would be of benefit to the trade. There were many grievances from which they suffered; but the worst, perhaps, was direct trading. Another question they would have to carefully consider was that of price maintenance. They were ratepayers; and it was not fair that the municipality should compete with them in their legitimate business as private traders.

PONTEFRACT GAS-WORKS PURCHASE ARBITRATION.

Surveyor's Institution.—Monday, Feb. 11.

(Sir Hugh Owen, *Umpire.*)

On the resumption of the proceedings to-day,

Mr. *Thos. Barker*, an auctioneer and valuer, called on behalf of the Corporation, said he did not agree with what Mr. Garside said as to the possibilities of the development of the surplus land of the Company for building purposes, excepting in regard to two pieces of frontage. He did not think anyone would build houses in the Company's neighbourhood while there was plenty of land available in better parts of the town. The direction building was trending was westerly; and the Gas Company's site was in the opposite direction.

Mr. *W. B. Keen*, F.I.C.A., handed in a list of the transfers of the Company's shares. He said that the last transfer before the notice to treat, in August, 1906, produced a yield at the rate of 5 per cent., and a transfer after the notice to treat was at the rate of 4¾ per cent. The financial position of the Company on Dec. 31, 1906, showed that they were overdrawn at the bank to the extent of £1011 7s. 4d., which he regarded as a very unsatisfactory feature. In addition to this, there were further liabilities of £335 11s. 11d. and £27 10s. 4d., and £1360 due to the shareholders on Dec. 31 last as half-year's dividend; the total being £2734 9s. 7d. Against these liabilities, there were outstanding debts for gas-rental £2992 13s. 10d., for rentals £461 18s. 3d., and for fittings 13s.; making a total of £3455 5s. 1d. These debts would come in gradually during the first half of 1907; and the Company would have to pay the working costs during this period. He put the working expenses at £1750; and they would have to pay interest on loans, amounting to £130 for the half year—making a total of £1880. He calculated that only £1575 could be treated as being available for paying off the liability of £2734; and therefore this left a current deficiency of £1159 4s. 6d. There was also a deficiency on the reserve fund of £2031 18s. 7d.; for, having regard to the length of the Company's life and the time during which they had been paying maximum dividends, there should have been at least £2724 in this fund—it ought to be full after such a long period. He considered that £1929 had come out of the profits and had been put to the suspense account. Altogether he brought the total deficiency to £3191 3s. 1d. This was a very unsatisfactory position. There had been considerable fluctuation in profits in the last ten years. In four years out of the ten, the net profit had been insufficient to provide the maximum dividend; and in three of the last five years it had not been earned. In the whole ten years the net deficiency was £664. Notwithstanding this, the maximum dividend had in fact been paid with the assistance of the reserve fund. He did not think any notice ought to be taken of the surplus of £600 in 1906. In that year the expenses for coal and repairs were exceptionally low, and, further, there was the fact that it was an account prepared after the notice to treat. It was obvious that the Company would desire to show a favourable balance. The last year was an unsafe one to take in regard to the transfer of the Company. He did not think the Company was a desirable investment. Where the maximum dividend had not been earned in four out of the last ten years, and in three of them it had not been earned by a sum exceeding the equivalent of 1 per cent., it was a very serious factor for an investor to take into account. Then the financial position disclosed by the balance-sheet—namely, that there was practically no reserve fund left out of which to make up any similar deficiency in future years, and the fact that the Company had got to the end of their capital resources—would make one seriously hesitate to buy the shares unless they had some very substantial yield on the purchase price. Then there was the question of electric light coming into competition.

In reply to Mr. Lankester, witness said that none of the shares mentioned in his list were sold by public auction. He had no knowledge of any of the shares being quoted on the Stock Exchange. It was unsatisfactory to have to go to the bank to borrow money to meet expenses; it was an unsatisfactory feature that the Company were entirely dependent on their bankers to meet their financial position.

Mr. *Alfred Walker*, J.P., a member of the Pontefract Council, also gave evidence.

Mr. *John Wilkinson*, the Engineer and Manager of the Halifax Corporation gas undertaking, said he had considered the valuation of Mr. Valon for the Company; and he disagreed with it. He supported Mr. Stevenson's valuation of £60,348, which was a liberal one. He was quite certain they could invest to bring an equal return on a better security. He thought the undertaking was suffering through being over-capitalized. The amount spent on meters, as shown by the Company, gave a life of 74 years per meter, as against a recognized life of 25 years. An alteration in the cost of coal was the most important fact in the alteration of the price of gas. Cheap gas was unquestionably essential to the development of the prepayment meter business; and he was of opinion that the Company must be dependent upon them for the extension of business, though he could not see where it could extend very much. The prepayment business involved greater annual expense by reason of the higher capital charge on meters and the greater cost of collection. The higher charge was met by an increased price for gas. In Yorkshire at the present time this was being objected to. In Halifax 1000 meters had been returned owing to the agitation, and at Huddersfield they were having a similar experience.

In reply to Mr. Clease, witness said that the leakage was 7·79 per cent. He considered that this was very high for the length of mains—16 miles.

Mr. Lankester: Mr. Stevenson has admitted that it is a very low leakage.

Mr. Clease: Then he disagrees with Mr. Stevenson on that.

Mr. *Garside* was recalled to substantiate his position as a valuer; and Mr. *G. R. Hemingway*, of Messrs. Leatham, Solicitors to the Company, also gave evidence.

Mr. Wedderburn, in addressing the Arbitrator, said that the Corporation were really buying an income; and the object of the award must be to insure to every shareholder in the Company an amount which he could invest so as to obtain an equal and equally secure income. The claim of the Company was grossly exaggerated. He

did not hesitate to say that, although he had been in a fair number of arbitrations, the portion of the claim based upon the conversion of the loan capital was entirely new to him. It appeared that it was made in two cases—in Morley and Skipton, in 1898 and 1899—and had never been made by anybody since. The Arbitrator would see at once that it was a strange and novel plan. The sum he had got to consider was divisible profits; and the profits capable of division must be maximum dividends on the issued, and not on the unissued, capital, because they could not divide dividends on unissued capital. In dealing with the question of security, he said that a witness who would come and say that this was a security equal to the best a man could get, would come and say anything. He contended that it was a great disadvantage to buy a gas undertaking which was saddled with a lot of surplus land. In conclusion, he should be very sorry if the Corporation had approached the case in a spirit as niggardly as the Company's case had been exaggerated.

Mr. LANKESTER replied at some length, and claimed that every figure he had put forward in his opening a week before was justified. Dealing with the point of the conversion of loan capital, he said that if the right to convert the money borrowed was a valuable asset, then it ought to be paid for. It certainly was not an absurdity to treat this concern as quite as good as an income secured in the ordinary trustee securities. He could not understand the pessimistic view of the Corporation; one could not conceive why they wanted a miserable, broken down, and unprofitable business like this. [Laughter.] He thought that probably the Arbitrator would take the intermediate view between the Corporation's excessive enthusiasm when before Parliament, and their extremely gloomy view in these proceedings. He argued that a substantial percentage should be added for compulsory sale. His friend suggested that it was a sum given for sentiment; but he did not know that 10 per cent. was ever given for this reason at all. There was no sentiment in the matter.

The proceedings then terminated; and the Umpire will in due course make his award.

WOKING AND GUILDFORD WATER ARBITRATION.

Arbitration proceedings between the Woking Water and Gas Company and the Guildford Corporation were commenced last Tuesday at the Surveyors' Institution, Westminster, before Sir JOHN WOLFE BARRY, K.C.B.

Mr. BALFOUR BROWNE, K.C., and Mr. W. H. DICKINSON, M.P. (instructed by Messrs. Charles A. Bannister and Reynolds), represented the Company; and Mr. E. HONORATUS LLOYD, K.C., Mr. VESEY KNOX, K.C., and Mr. R. S. CLEASE (instructed by Mr. F. S. Miller, Town Clerk) appeared for the Corporation.

Mr. BALFOUR BROWNE, in opening, said that the object of the arbitration was to settle, under the provisions of section 38 of the Woking Water and Gas Act, 1899, sub-section 4, the price and terms of purchase by the Guildford Corporation of such portions of the Company's undertaking—except the mains, water-works, pipes, &c., necessary or convenient for supplying water elsewhere within the Company's limits—as were included within an extension of the borough of Guildford. The limits of the Company were extensive; but the part which was affected in this arbitration was to the north of the borough of Guildford, and was added by the Act of 1904. The district was that known as Stoke-next-to-Guildford. In detailing the history of the Company, the learned Counsel said that they had obtained three Acts of Parliament, and had extended their powers and capital on several occasions. Under their original Act of 1881, the capital was £50,000, with borrowing powers to the extent of £12,500. It had now been increased until the authorized loan and share capital was as follows: Share capital, £228,250; loan capital, £57,062—making a total of £285,312. Of this sum, there had been raised in share capital £168.515; and there had been borrowed £38,312—making a total of £206,826. The Company still had power to raise by share capital £59,735, and by borrowing £18,750—a total of £78,485. The profits of the Company for the last seven years had been: In 1899, £4936 15s. 1d.; in 1900, £5051 0s. 5d.; in 1901, £5489 12s. 7d.; in 1902, £6113 6s.; in 1903, £7594 5s. 1d.; in 1904, £8121 15s. 11d.; and in 1905, £8707 1s. 10d. This profit was before reckoning payment of interest on loans—the total divisible profit between the Company and the persons who had lent their money. Every year there had been a steady and substantial increase in the revenue of the undertaking. The dividends paid had not been large. Since June, 1901, they had not been able to pay more than 4 per cent.; but the reason was that no less than £80,958 had been spent on the Chertsey station, with a view to future profits. By this station water was able to be drawn from the River Thames. The present supply of the Company averaged only 630,000 gallons; the maximum supply being about a million gallons, or 30 gallons per head of the population per day. The total population was 34,736. It was calculated that the supply needed in 1917 would be 1,645,175 gallons, which was a quantity well within the Company's means. The price at which the portion of the undertaking in question was offered to the Corporation was £105,307, exclusive of costs. The Corporation replied to this by making an offer of £18,700. He could only conceive that the Corporation had taken some altogether wrong basis of calculation. The basis the Company had gone upon was the value to them of the portion of the undertaking that was taken from them; and the value to them was what they made out of it.

Mr. HONORATUS LLOYD remarked that he was not going to suggest any other basis than that put before them.

Mr. BALFOUR BROWNE said that, then, would save a good deal of time; for he would now proceed to deal with the claim. He stated that the offer of the portion of the undertaking in question for £105,000 was merely a rough estimate; and, on going into the matter more fully, the Company had arrived at a more exact claim, which they made £73,626. This was arrived at as follows: Profit for 1905, £907 (for the severed area), and this sum, capitalized at 36·36 years' purchase, was £27,908; present value of the future prospects of the Company, £28,521; arrears of dividend, £7551; damage by severance, £9969—making a total of £73,949. From this amount would have to be deducted £7016, being the sums that would have to be spent in order to maintain the portion of the undertaking in question. This brought the claim down to £66,933. Then it was proposed to add 10 per cent. for compulsory purchase, £6693—making the total claim to be £73,626.

Mr. *B. D. Holroyd*, the Secretary of the Company since 1892, having given evidence, the proceedings were adjourned.

The proceedings were resumed on Friday, when

Mr. *Joseph Quick*, M.Inst.C.E., the Engineer to the Company, describing their works and plant, stated that there were 120 miles of mains in the district at the present time. The quantity of water supplied in 1888 was 70 million gallons; in 1893, 102 millions; in 1897, 133 millions; in 1898, 121 millions; in 1899, 125 millions; in 1903 (when the new works came into operation), 187 millions; and in 1905, 230 millions—a daily average of 632,000 gallons. The number of houses supplied in 1902 was 4305, increasing to 4770 in 1903, 5322 in 1904, and 5732 in 1905. Apart from the Bisley Camp, there was a population of 3722 persons in public institutions in the district. The daily average consumption in the Company's area in 1905 was 18·95 gallons per head of the population. On this basis, the maximum daily supply which would be required in 1917 was 1,687,000 gallons, and the average daily supply 1,130,000 gallons. To meet this, the Company had an available daily supply of 800,000 gallons from the Clandon wells and the Dapdune well, and 2,000,000 gallons from their Chertsey well; or a total of 2,800,000 gallons without taking any water from the Thames. If desired, they could take from the River Thames 1 million gallons per day unconditionally, and a further 2 millions conditionally. In taking 30·77 years' purchase as the multiplier to arrive at an estimate of the future profits on the area proposed to be taken by the Corporation, he thought the Company were claiming by no means a high price. The income was amply secured, as shown by the steady increase in past years; and the district was a rapidly growing one. It had been arranged that the Corporation should take the existing mains which would be required by the Company for the supply of parishes outside; and the Company would lay a new main through Stoke at the expense of the Corporation. An item of £7551 was claimed for arrears of dividend; and this amount was arrived at upon the basis that in the year 1918 the profits would have swelled to an amount sufficient to pay the maximum dividend, and in the following years there would be a sum left to pay off the arrears of the previous period.

The ARBITRATOR: Have you made any comparison between the estimated proportion of capital expenditure in the severed area up to 1924, and the probable special expenditure in that district?

Witness: No.

In reply to Mr. BALFOUR BROWNE, witness said the proportion of mains in the severed area was greater than in the rest of the district, so that, instead of the capital outlay in the severed area being £7016, it would be £2020 or £3000 less in respect of future expenditure.

Replying to Mr. VESEY KNOX, witness said he had always taken a very sanguine view of the prospects of the Company's area. He regarded the Woking district as a kind of second Croydon.

Mr. VESEY KNOX: Woking is the centre of your district, and the place where you derive most of your revenue?

Witness: Woking was at one time the best part of the district, and is now an exceedingly good one; but this neighbourhood would be equally as good as Woking.

Are certain works to be freed by the severance of this district which you can use more economically than your Chertsey works? Is there any sum credited to the Corporation for that?—The economy would be small, and nothing has been credited.

Mr. BALFOUR BROWNE: The rate of increase in the severed area in 1904 was 9·81 per cent., compared with 7·1 per cent. for the whole district; and in 1905 the respective figures were 8·78 and 8·21?

Witness: Yes, that is so.

Mr. *Walter Hunter*, M.Inst.C.E., said there was a large and rapidly-increasing population in Stoke, which had an area of 2000 acres. It was close to Guildford; and it was in this direction that the town must develop. It was one of the most valuable portions of the Company's undertaking. He thought a percentage of 41·3 was a fair expenditure compared with the income derived from the severed area. He agreed with the number of years' purchase estimated by Mr. Quick (30·77), and should have placed it on a higher basis himself but for an expression of opinion in the London Water Arbitration. In his view, the Company were in a better position than the London Companies, because there was no sterilization clause or interference with future profits.

Mr. VESEY KNOX: Do you say there will be a loss to the Company in perpetuity of £324 on working expenses in consequence of this severance?

Witness: I will not give an opinion on that; I would rather leave it for the Arbitrator.

The ARBITRATOR: Is there any reason why the increase in working expenses shall not be upon the same basis in the severed district as in the remainder?

Witness: I should say the working expenses in the retained district will be greater than in that given up.

The ARBITRATOR: Then your opinion is that it is a concession taken relatively?

Witness: That is my opinion.

Sir *Alexander Binnie*, M.Inst.C.E., agreed with previous witnesses that the multiplier of 30·77 was a fair figure to take in dealing with the Company's undertaking.

Mr. BALFOUR BROWNE: If you take a valuable asset from us, and leave us with expenses we cannot by any possibility reduce, is not that a fair matter for compensation?

Witness: I say it is a fair matter for compensation. The difficulty is how to arrive at it.

Replying to Mr. VESEY KNOX, witness said Thames water had been declared by the best authorities to be a good supply. Parliament had given the Company a legal right to take the water; and they were entitled to regard it as a profitable asset.

At this stage the proceedings were again adjourned.

FALMOUTH GAS BILL.

Opposition by the Corporation.

A Meeting of the Falmouth Town Council was held yesterday week, to decide whether a petition should be lodged against the Bill which is being promoted by the Falmouth Gas Company.

At a previous meeting, suggestions had been made of alterations which the Corporation desired should be effected in the Bill; and the question was now asked whether any reply had been received from the Gas Company. The Town Clerk said he had received a letter from the Secretary, suggesting that a conference between the Corporation and the Directors should be held that morning. Mr. E. Williams and Mr. Chard strongly protested against the action of the Mayor in not responding to this invitation. Mr. Williams had previously been in favour of lodging a petition; but he now contended that the suggested conference ought to have taken place before the meeting of the Council, and that its probable effect would have been to avoid the cost of opposition in Parliament. Mr. Owen held that it was unreasonable to ask them to meet the Directors two hours before the time fixed for the Council meeting. Personally, he agreed with the Town Clerk that they should lodge the petition first and have a conference afterwards.

An acrimonious discussion followed as to the exact nature of previous correspondence between the parties, and the understanding with regard to the lodging of the petition. Mr. Fox contended that, even if the conference had been held with the Directors that morning, it would still have been necessary to lodge the petition. It would not prejudice either side in the least in the concessions they might get or make. Mr. Mead, on the contrary, thought it would have been a saving of trouble and expense to meet the Directors. If the conference had been held, the Council meeting could have been adjourned until later in the day to give them an opportunity of considering the matter. Mr. Cox also took the view that there should have been an opportunity of coming to a friendly understanding with the Company. Mr. Bullen said the Mayor had acted wisely. The Corporation were not in a position to meet the Company that day any more than the Directors were prepared to meet the Corporation when they were previously invited to do so. It was only fair and just that the Corporation should have the same opportunity of protecting the interests of the ratepayers as the Directors had of looking after those of the shareholders. The door was still open for friendly negotiations; and he hoped the Directors would see this. The Town Clerk pointed out that the petition must be lodged on the following day; and he advised the Corporation to lodge it, and then see what concessions the Company were willing to make.

On a vote being taken, it was decided to lodge the petition; three members who had spoken against it being not present when the vote was taken. The General Purposes Committee of the Council were authorized to take the necessary steps to oppose the Bill.

Report of the Corporation Engineers.

Messrs. Stevenson and Burstal are the Engineers advising the Corporation. In their report, they point out that the £20,000 which the Company propose to raise will enable them to keep away from Parliament for at least fifteen years, if the growth of the undertaking is at the same rate as hitherto. They advise that there should be a proviso that none of the loan capital shall be converted into share capital, and that the auction clauses shall apply to loan and share capital alike. They also consider that the rate of 6 per cent. at which it is proposed to issue preference stock is too high, and that it should not exceed 5 per cent. With regard to the proposal of the Company to substitute the "Metropolitan" argand No. 2 burner for the Sugg "London" argand burner now in use for testing purposes, Messrs. Stevenson and Burstal say they should not advise that any opposition be made to this burner, because it is the only known burner which shows the actual illuminating power of the gas; and in a very short time it will become the common standard burner for all gas companies. Nor do they object to the mode in which the gas is to be tested. But they draw attention to the fact that the use of this burner will enable the Company to supply gas of a lower illuminating power than they do, or may do, at present, and yet keep within the prescribed illuminating power of 15 candles. The Company, they say, by this obtain an alteration of the illumination power in their favour of at least 2 candles. It is usual and almost universal that a reduction in the illumination power is accompanied by a reduction in price; and therefore in their opinion the standard price of gas should be reduced at least 2d., which will be approximately the saving effected by the Company. They think there is no possibility of the Corporation obtaining a reduction in the standard price except upon this ground.

Another point upon which Messrs. Stevenson and Burstal report at length is a proposal by the Company to acquire additional land for the extension of the works. They say that the works are in a very cramped and crowded position, and that the small area of ground proposed to be acquired will do little if anything to alleviate this condition. They urge that now is the proper time, if ever, to shift the works from the centre of the town to somewhere on the borders of it. Any further expenditure upon the present or the proposed extended site would entail a greater cost of removal in the future; and the time must come, if the undertaking grows, when it will be absolutely imperative that the works should be removed and new ones erected. Replying to a question asked by the Corporation, Messrs. Stevenson and Burstal say they do not think the Corporation could successfully ask for the introduction of a clause prohibiting the Company altogether from the use of water gas; but they might possibly obtain a clause restricting its use to a certain percentage, except in an emergency. This is a point, they add, which has not been seriously brought before a Committee of either House. In reference to the accounts, the report draws attention to certain apparent illegal acts committed by the Company. The Engineers add that in the event of the Corporation deciding that they would acquire the undertaking if they obtained the sanction of Parliament, there is very little doubt that a purchase clause might be inserted, or at least a suspensory clause, prohibiting the Company from making any use of the powers which the Bill may confer until the Corporation have had a chance of introducing a Bill. They have no doubt that purchase would be remunerative to the town.

The Corporation's Petition.

In their petition against the Bill, the Corporation submit that in the interests of the borough the works should be in their hands; and that in order that they may have an opportunity of applying for powers to purchase the undertaking, provision should be included in the Bill suspending its operation. It is alleged that large sums have been expended by the Company out of revenue for the provision of new mains and works, instead of being applied to the reduction of the price of gas. The Corporation submit that it is inexpedient to further extend the works upon the present site; and that the Company should be required to procure a more suitable site at a distance from the more inhabited parts of the town. Restrictions should also be imposed upon the Company with reference to the use of their existing land, and to the generation and supply of water gas and the manufacture and conversion of residual products. Provision should also be made for imposing penalties upon the Company for allowing gas liquor and other objectionable substances to fall into the harbour. Among other matters dealt with, the Corporation repeat the argument of Messrs. Stevenson and Burstal as to the effect of the substitution of the "Metropolitan" argand for the "London" argand burner for testing purposes, and contend that the standard price should be correspondingly reduced.

WORTHING CORPORATION AND THE GAS COMPANY.

The Proposed New Works at Goring.

The Bill which the Worthing Gas Company are promoting in the present session of Parliament, to enable them to erect works at Goring, to extend their limits of supply, and for other purposes, has been the occasion of much negotiation between the Parliamentary Committee of the Corporation and the Company. As a result, the Committee obtained satisfactory assurances on all but two points; and under these circumstances, a special meeting of the Council was held last Saturday week, for the purpose of deciding whether the Bill should be opposed. After deliberation, the Council approved of a petition being presented if the Committee did not receive the assurance of the Company that all the Council's requirements would be given effect to.

At the commencement of the proceedings, the Mayor (Alderman F. C. Linfield, J.P.) stated that he had received a letter from Mr. Schweder, to the effect that the whole of West Worthing was against the scheme. The Mayor also announced that he had received a deputation from several of the owners and residents round about the existing gas-works, who wished to be assured that if the works were removed the Company would not erect another or larger gasholder on the site. The way having thus been cleared for debate, Alderman Piper proposed that the seal should be affixed to a petition against the Bill; but that it should not be lodged if by 2 o'clock on the following Monday they were assured that the Company would so amend the Bill as to give effect to all the requirements of the Council set forth in the petition. They did not, he said, oppose on the ground of the site. They realized that the Company must carry on their business somewhere; and it was perfectly intelligible that wherever they went the people in the immediate neighbourhood would look upon them as a nuisance, and do their best to keep them away. But as representing the town, he submitted that it was more in the interests of the borough that they should have gas-works erected 850 yards from their western boundary, than that they should run the risk of having the works extended almost in the centre of the town. On most of the points on which the Committee had met the Company, he must say that the latter had met them very fairly indeed. For instance, they had agreed to prepare a clause to the effect that within ten years of their beginning to manufacture gas at Goring thay would cease to do so on the present site. They had agreed that nothing in the Bill should be construed as admitting a right on their part to discharge sewage into the sea at Goring; and they had also agreed that the proposed preference shares should only be entitled to a dividend of 5 per cent., instead of 6 per cent. With regard to the renewal fund clauses, the Committee considered the Company's proposal to be able to set aside a sum not exceeding 1 per cent. of the total capital until 20 per cent. had been accumulated, was too much; and they had suggested that the limit should be ½ per cent. each year, until the total reached 5 per cent. of the capital. Unfortunately, the Company had not so far assented to this; and they had also failed to meet the Committee's wishes with reference to the excess of profits. At present, the latter clause in the Bill read as follows:—

> If the clear profits of the undertaking of the Company in any year amount to a larger sum than is sufficient to pay the dividends on the preference capital, if any, and dividends at the authorized rates on the Worthing gas consolidated ordinary stock of the Company, the excess of such portion of it as is not carried to the insurance fund or renewal fund shall be carried to the credit of the divisible profits of the undertaking for the next following year.

Unless some alteration was made to this clause, the members would see that the Company might go on carrying over and piling up the excess of divisible profits year after year; and the public would not stand the remotest chance of getting a reduction in the price of gas by the operation of the sliding-scale. The Committee had accordingly suggested a limit of three years for this arrangement; and though the Company had so far been unable to comply with their wishes, he was in hopes they would see their way to do so before the period for sending in petitions in opposition expired.

When the motion had been seconded, an amendment was proposed by Mr. Gravett, to the effect that the latter part of the resolution should be deleted, and the petition be lodged in any case. This, he argued, would give the ratepayers an opportunity of raising their voice for or against the Bill; and it would also give the Finance Committee further time to negotiate with the Company. Mr. Chignell

regretted that the question of the site was to be left out altogether; but the Deputy-Mayor (Alderman J. White, J.P.) remarked that the distance from their boundary to the proposed new works was such that they could not successfully resist the location of gas-works there; and he for one would be the last to recommend that the Council should become the catspaw of any person who might wish chestnuts to be pulled out of the fire for him. Dealing with some of the points that had been the subject of negotiation with the Company, he pointed out, with reference to the renewal fund and the disposal of surplus profits, that the competition of the Council's electric light undertaking would make it to the Company's interest to behave as liberally as possible to the consumers. Seeing that they had so nearly approached complete agreement with the Company, he thought it would be manifestly unfair both to the Company and to the Committee to throw all their negotiations on one side, and place themselves in an attitude of extreme antagonism to the Company. Several members asked what the Company would do with their effluent and drainage at Goring; but Alderman Piper suggested that this question (with the assurance they had had from the Company as to not discharging it into the sea) could be safely left with the Goring Sanitary Authority.

Later reports stated that there was every reason to believe that all the assurances demanded by the Council from the Company would be forthcoming.

TESTING OF BIRKDALE GAS.

The Proposed New Burner.

In moving the adoption of the Southport Gas Committee's minutes by the Town Council, Alderman Travis drew attention to the following recommendation: "That the Engineer be empowered to arrange for the daily testing of gas in Birkdale, and to hire a room and purchase the necessary apparatus." At the present time, he said, regular testings were not made in Birkdale. He found that on Jan. 4 the gas was tested there; and it showed an illuminating power of 16·02 candles. On Jan. 8, it was tested again; and the average was 16·012 candles. These were the only two tests taken during the four weeks; and the Committee thought it desirable that they should have regular tests, so that they might know exactly what was the quality of the gas they were supplying, not merely in Birkdale, but in other parts of the town at a similar distance from the gas-works. Of course, tests would also be regularly taken as to the pressure of the gas. A room would cost about £10 a year; and the fitting up would entail an outlay of about £100. They were desirous of giving every satisfaction to the gas consumers; and they thought the present proposal was a step in this direction.

Alderman Travis also alluded to another recommendation of the Committee: "That the Chairman and Town Clerk be empowered to give an assurance to the Board of Trade that any saving which may accrue in consequence of the use of the 'London' No. 2 argand for testing the gas shall be given to the gas consumer." This, of course, he pointed out, was subject to the fluctuations in the prices of the carbonizing materials. He himself had had a hope that if they secured this burner for the purpose of testing the gas, added to certain improvements in the method of manufacture which they were carrying out, they might have been able to make some reduction in the price of gas. But the price of coal had gone up very considerably; and therefore it was impossible to carry out the idea of a reduction at the present time. The Committee hoped, however, notwithstanding the advances in the price of coal, that if the burner were allowed by the Board of Trade—and they now had every reason to believe that it would be—together with the improvements they were adopting at the gas-works, they might be able to stand the advances without any increase in the price of gas. He hoped that this had seen its highest point.

The minutes were confirmed.

Lincoln Water Supply.

At the Guildhall, Lincoln, last Thursday, Mr. W. O. E. Meade-King, M.Inst.C.E., an Inspector of the Local Government Board, held an inquiry into an application by the Corporation for sanction to borrow £11,082 for purposes of their water-works undertaking. In the course of the inquiry, evidence was given by Mr. Neil M'K. Barron (the Water-Works Engineer) and by Mr. J. H. Burgess (the City Accountant). Mr. Page explained that the work had practically been completed, and the application for power to borrow the money was lodged in February, 1906, so that it had been before the Board for a year. Speaking generally, a great deal of work was necessary at the filter-beds, as a new bed had to be constructed; a rearrangement was required of connecting-pipes, valves, &c.; and new mains were wanted. The proposed expenditure would come really under three heads: (1) The new filter-bed; (2) the improvement of the existing beds, with all the necessary pipes and valves; and (3) new clear and raw water tanks and an iron aqueduct from two sources of supply known as the ballast pits and Hartsholme Lake. The exact cost was £15,015, and it was intended to pay one-seventh of it out of revenue. Mr. Barron gave a detailed account of all the work done. The Inspector inquired as to the possibilities of the borehole; and it was stated that the boring was going deeper into the pebble beds with the hope of getting a greater supply, and possibly a better quality, of water. The contractors had claimed £2000 as extras, because of the alleged interference with their special work by reason of the Corporation doing other work on the same ground; but the claim had been settled for £414 14s. 10d.

Hire of Gas-Stoves at Burton.—Owing to bad trade, many of the houses in Burton-on-Trent have become empty; and the Gas Committee are therefore in the unfortunate position of finding themselves with many gas-cookers on their hands. Under these circumstances, an arrangement has been come to between the Council and the ironmongers of the town for the pushing of these appliances; the ironmongers to be allowed a quarters's rent on the stove and the price of fixing.

THE PARTIAL FAILURE OF DUNDEE GAS.

Reference was made in our "Notes from Scotland" last week, and is again this week, to the partial failure, in the matter of illuminating power, of the gas supplied in Dundee, on the evening of Thursday, the 7th inst., and to the Engineer and Manager (Mr. A. Yuill) having reported to the Gas Committee upon the subject. The following is the text of Mr. Yuill's report.

It is my duty to report to you about a diminution in the illuminating power of the gas supplied during a part of the evening of Thursday, the 7th inst. The first intimation I had of this was while I was engaged in the gas office, Commercial Street, a little after 4 p.m. I went immediately to the works, and found that the cause was due to air having been drawn into the main-piping at the retort-house. In the first case, I ascertained that the gas passing from meter to gasholder was all right, and immediately took steps to lessen the difficulty and improve the gas going into consumption, which happily passed off at the extreme end of the city about 6 p.m. On Thursday morning, 24 retorts were put out of action, the gas from which would be all evolved by midday. On investigating the matter, I find that no information was received by the exhauster-house attendant to alter in any way the vacuum previously arranged for. To facilitate this, a telephone was erected over three years ago, so that those in the retort-house may command any vacuum they desire. At the time above noted, an inferential jet photometer was also erected in the meter-house under the observation of the attendant there, to take periodical inspection of same and note the hourly readings in the meter-book, along with the make of gas, the pressure, and stock. On making an inspection, I was surprised to find that the jet photometer failed to register the standard quality at 3 p.m., and was noted in the book; the same entry appearing at 4 p.m. And, despite this, no action was taken by the meter-house attendant nor information imparted to either Mr. Donald or Mr. Gentry, the latter of whom attends to the illuminating power of the gas. I have taken steps to have the meter-house attendant who was in charge that afternoon removed to another position demanding less responsibility.

Another phase of this question presents itself in the fact that no one at the works was conscious of anything being wrong until telephoned from the gas office before leaving for the works—which undoubtedly points to carelessness and neglect. I am conscious you share with me in the desire to lessen as far as possible any difficulties and inconveniences to consumers; and, as you are aware, when dealing with the human element we are at once faced with a difficulty not easily got over, more especially when the actions savour of stupidity or indifference. At the same time, I feel that even this must be minimized as far as possible; and with this object in view, I have arranged to have a self-recording pressure-gauge fitted up in the exhauster-house, to give a record of the vacuum during 24 hours, and will also have the governing arrangement of the exhausters rendered as sensitive as possible, to minimize any risk, and take other means to maintain a constant vacuum on the retort-bench.

PROGRESS OF GAS SUPPLY AT GUILDFORD.

Interesting Reminiscences.

In a recent number of the "Surrey Times," some particulars in regard to the progress of gas supply at Guildford were given in a letter by Mr. D. Williamson, J.P., who was formerly Chairman of the local Gas Company. Personal reminiscences of this kind are specially interesting at the present time, in view of the recent occurrence of the Centenary of Gas Lighting in London; and we therefore make the following extracts from the letter.

Gas was introduced to Guildford in the year 1823 by a Mr. Rofe, who invited the Toll End Company (that is, the Road Commissioners) to join him in the erection of gas-works. This was in the month of October, and the enthusiastic promoter promised that the lighting of the town could be accomplished by the following Christmas. Such a pace was, however, resented by the authorities, and considerable delay occurred before the Company was actually formed. The proposed capital was £3500; and on this basis the works were built and mains laid in 1824. But, like many other such estimates, the actual cost was some few hundreds more. A meeting of the townspeople was called, and it was decided to increase the capital to £4000, and shares of £25 each were issued.

It was necessary to place the works on the lowest level of the town, and also near to the river, as all the coals had to be brought by barge; so the site was in the new Farnham Road. They were thought to be sufficiently large to provide gas for the lighting of the streets and shops, "as well as the private residences of such of the gentry and shareholders as may be pleased to admit it into their houses." It was doubtless regarded as a dangerous innovation, and its progress was very slow. For many years the Company did not pay a dividend, as the promoters had agreed that the rating for watching and lamps was not to be increased; but this restriction was afterwards waived by the town authorities. The Trustees of the Epsom Road would not go to the expense of a light at the top of Spital Street, so the Gas Company erected a handsome pillar and lamp at their own cost; and this still exists with an explanatory inscription upon it.

With regard to the plant, Mr. Williamson records that the retorts were of iron, from 5 to 6 feet long, instead of the present fire-clay retorts 19 feet in length, though the number they began with was 10. Three were placed over one furnace, and two over another; and the other five were apportioned for the production of coke suitable for the maltsters. One of the old iron retorts was long preserved as a curiosity at the works. In the summer season, it was thought that two retorts would be sufficient; in spring and autumn, that there might be three; but that in winter five retorts would be available. There are now about 144 retorts in use, requiring something like 14,000 tons of coal per annum. The original gasholder would contain 12,988 cubic feet; but

it has long been deposed from its high position to become an underground tank for tar. The holders now in use are of the aggregate capacity of 1,430,000 cubic feet, or considerably more than a hundred times larger than the holding capacity in 1824.

As the works were not prospering, they were let in 1827 on a five years' lease to a Mr. Wilder, who paid an annual rent of £40 to the Company, and was to have some advantages from any extension of gas lighting or the sale of coke. He was succeeded by Mr. William Hooke, who had much to do with the extension and popularity of the undertaking. The price of gas was then 15s. per 1000 cubic feet; but under his able supervision it was considerably reduced. In the early forties, Mr. Hooke called in the help of Mr. J. O. N. Rutter, who was then the Engineer of the Old Brighton Gas Company, and one of the foremost gas authorities in the kingdom. He advised considerable reconstruction of the works, and a still further lowering of the price, so as to make the use of gas more popular. Mr. Rutter always spoke in the highest terms of Mr. Hooke as a man of great capability and intelligence, not only in his business, but as a widely cultivated man. He has been succeeded by many capable managers. The removal of the works from Farnham Road to the present site in 1852 brought in the necessity for more scientific management and economical processes. The price of gas was gradually reduced, until in 1880 it had been brought down to 4s. per 1000 cubic feet. Since then, by gradual reductions, it has reached the present figure of 2s. 11d. The annual make of gas is now about 180 million cubic feet. The reconstruction of the works and the building of the large gasholder were rendered necessary by the great extension of the business. This was begun under the chairmanship of the late Mr. Mark Smallpeice, when a sum of more than £20,000 was expended.

Mr. Williamson closed his letter with the following remarks: "It has been well said that if you find a town well lighted it is, as a rule, being well administered. This can be claimed for Guildford; for the town authorities were one of the earliest to give their sanction to the present system of incandescent lighting over the 30 miles of mains in the enlarged borough. Money wisely spent on street lighting is a great help to lessen crime, vice, and dirt, not only for the principal streets, but still more for those in which the labouring classes reside. The enormous demand for gas-stoves for cooking shows its wide appreciation, as well as the yearly increase of gas-engines. The competition of electric lighting has been of great benefit in stimulating invention, and keeping down the price as low as possible consistent with good illuminating qualities. Long may they flourish! There is surely plenty of room for both. The call is ever for more light, and in neither case is there likely to be any finality for a long while to come; nor are the possibilities of the two rivals for the benefit of the public yet able to be estimated."

SHREWSBURY WATER SUPPLY.

Reduction of the Water-Rates—Serious Friction with the Local Government Board.

At the Meeting of the Shrewsbury Town Council on Monday last week, the report presented by the Water Committee contained a recommendation for a reduction of the water-rate, to be effected by fixing it at 5 per cent. on the rateable value of property supplied with water, instead of at 6 per cent. as hitherto. It was stated that the reduction would amount to nearly 2½d. in the pound. Then came the following paragraph: "The necessary application has been made to the Local Government Board for sanction to the loan of £5000 for protecting and improving the supply of drinking water to the borough; but your Committee deeply regret to have to report that the Board have declined to entertain the proposal unless the Council will give an undertaking to proceed with a scheme for the general supply of the town. The Board urge that Mr. G. R. Strachan's river scheme (estimated to cost £88,000) should be taken in hand, and suggest that this may be proceeded with without the consent of the ratepayers. The position is a difficult and serious one, and a deputation, consisting of three members of the Water Committee, has been appointed to wait upon the Board and explain the urgency and importance of the question, and the serious consequences which must ensue if the Board decline to recede from the attitude they have taken up."

In moving the adoption of the report, Alderman Morris, the Chairman of the Committee, said he was sure the Council and the town generally would be glad to see that the Committee recommended a reduction of the water-rate. Another paragraph in the report did not afford such pleasant reading. Putting the matter in a word, it was this—that the Local Government Board were of opinion that they were much better able to manage the water undertaking of the town than the Council themselves. Following upon the resolutions of the Council authorizing the Committee to incur an expenditure of £5000 in improving and extending the conduit supply, application was made to the Local Government Board for sanction to borrow the money. Correspondence had taken place, and the position which the Board had taken up was, to his mind, a puerile one. They did not say for one moment that the Council were not wise in taking the steps they proposed, but they told them they would not allow them to carry out the work unless the Council would give them an undertakiug to proceed at the same time with a larger scheme for the general supply of the town. Such a position they did not mean to accept "lying down." They knew what the town wanted better than the Local Government Board. He might say that every step was being taken to overcome the difficulty, and at the present moment they were engaged in trying to arrange that a deputation of the Water Committee should have an interview with the President of the Board. His own view was that their position was being prejudiced by officialism; and he thought if they could only get an interview with Mr. Burns, they would be able to convince him that the attitude they had taken up was the right one. The Committee had made up their mind that the land at the conduit head must be purchased; and he thought the position taken up by the Central Authority was a most ridiculous one. The report was adopted.

ENGLISH AND FOREIGN COMPANIES IN FRANCE.

In the "Financial News" recently attention was called by M. Pellerin, a French Barrister, to the passing, on the 31st ult., of a Finance Bill in which there is an article (No. 3) containing stringent provisions affecting French, English, and Foreign companies contemplating issuing shares or debentures in France, or whose securities may be dealt with in that country. M. Pellerin had previously directed attention to the matter, and his letter was noticed in the "JOURNAL" for the 15th ult. (p. 171); but he returns to it because he thinks too much publicity cannot be given to the enactment, which comes into operation on the 1st prox. After this date, it will be necessary, before any steps are taken to issue or offer for sale upon the French market any shares, debentures, or securities, of whatever nature, of French or Foreign companies, to insert, in a "Bulletin" annexed to the "Journal Officiel," in a form to be determined by a special decree, a notice containing the following particulars: (1) The full name of the company or of the undertaking; (2) an indication of the law which will govern the working of the enterprise; (3) the registered office; (4) the objects of the enterprise; (5) its duration; (6) the amount of the capital, the amount per share of each category of shares, and the amount of capital remaining to be called up; and (7) the latest balance-sheet, certified as being a true copy, or a statement that the same has not been drawn up. In addition to giving these particulars, the advertiser must state the amount of debentures already issued by the undertaking, with a description of the securities attaching thereto, and, if it should relate to a fresh issue of debentures, the number as well as the value of the securities to be issued, the interest payable upon each, the date and the conditions of reimbursement, and the guarantees or security upon which such further issue is based. Persons issuing, offering for sale, or selling, and persons introducing these securities for sale or issue, must be domiciled in France; and they must affix their signatures, with their addresses, to the notice. Advertisements, prospectuses, and circulars must reproduce the statements contained in the notice, and mention that it was inserted in the "Bulletin," with a reference to the number in which it was published. Every foreign company making a public issue in France, or offering for sale or selling or introducing shares, debentures, or securities of any nature, must, in addition, publish in full the Memorandum and Articles of Association, in the French language, in the "Bulletin," previously to any securities being placed. There are some other provisions in the article; and non-compliance with any of them will be punishable by fines ranging from 10,000 frs. to 20,000 frs.

A BELATED CONFESSION.

An extraordinary story of wrong doing and very belated confession was published in last Tuesday's "Express," the writer of which puts it forward as a remarkable illustration of Æsop's fable of the frozen adder.

It is stated that some 24 years ago Mr. Henry Snelling became Manager to the Northfleet and Greenhithe Gas Company. A year or two later, he befriended an orphan lad named Pearce, provided him with an outfit, and found a place for him in his office. Pearce was a bright, intelligent lad; and in a few years' time rose to a position in the Company second only to the Manager himself. Towards the end of 1890, a series of threatening letters reached Mr. Snelling; and as they continued, he began to suspect a conspiracy, and spoke to the Chairman of the Company about the matter. Then he discovered that similar letters had been forwarded to the Chairman; and that statements had been made that he had embezzled money and falsified the accounts.

Mr. Snelling at once asked that the fullest inquiry might be made; but before this was undertaken, the office was broken into and the credit-book stolen. With the books that remained, the fullest investigation was made; and it failed to disclose anything wrong with Mr. Snelling's accounts. Feeling, however, that suspicion still rested on him, he resigned his post, despite the expressed wish of the Directors that he should stay on. A Committee of prominent townsmen who believed in his innocence, was formed for the purpose of investigating the matter; but they were unable to secure any material evidence. To make matters worse, they were handicapped by the fact that anxiety and worry had resulted in Mr. Snelling being laid up by an attack of congestion of the brain, which for some time endangered his life. Meanwhile, Pearce was appointed Manager; but he did not hold the post long, and in 1893 vanished from the locality. Mr. Snelling recovered from his illness; but his life was ruined. Now, however, his name has been completely cleared; and he has discovered that all his troubles were originated by the orphan he befriended.

A letter has reached him from Saskatchewan, Canada, written by Pearce, in which he says that it was to cover his own faults that he had anonymously accused Mr. Snelling. "I write this as a duty before God," he adds; "and I am sorry for having been guilty of anything so mean. But the influence of Satan had fast hold of me; and I believe I would have done you all the injury I could. I hope you will forgive me."

Birmingham Prepayment Meter Thieves Sentenced.—At the Birmingham Quarter Sessions, Arthur Grafton and Arthur Gardner were indicted for burglariously entering a dwelling-house and stealing 1s., "the moneys of the Lord Mayor, aldermen, and citizens of the city of Birmingham." Prisoners were seen by the police to enter the cellar of the house in question; and it was subsequently found that the slot-meter box had been broken open. It was stated that the prisoners (who were found to have a number of pennies in their possession) had been engaged in this class of crime for some time. The Assistant-Recorder said he would recommend the prisoners to be dealt with under the new Borstal treatment. In order that they might derive the full benefit of this system, he would send them to prison for eighteen months with hard labour.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

Regarding the occurrence in connection with the gas supply in Dundee on Thursday of last week, the "Dundee Advertiser" of Tuesday last says that the matter engaged the attention of the Corporation Gas Committee on the previous day, and that a report upon it by the Manager was submitted. It seemed that the cause of the trouble was the admission of an undue quantity of air into the gasholders. Further, it transpired that on the day in question 24 retorts had been put out of operation. For the diminished load, due allowance was not made in working the exhausting mechanism, with the result that, owing to the abnormally high vacuum, air found its way into the holders. It was also shown that in the meter-house an instrument employed for testing the illuminating power of the gas before it passes into the holders had given readings very far below the normal. The Manager, who was engaged at the gas office in Commercial Street at the time of the occurrence, stated that he had made inquiries into the matter, and found that at three, four, and five o'clock the readings were given as zero, instead of 12, which is about the standard. In the Committee there was some discussion and explanation of the technical points at issue, and a general insistence that the matter should be investigated to the bottom. There was talk about personal responsibility for an occurrence which tended to shake public confidence in the gas-works. In the end, it was resolved to adjourn consideration, and that a visitation, for purposes of further inquiry, should be made by the whole Committee to the works. This visit took place yesterday. The Committee inspected the works, particularly the retort, exhauster, and meter houses, and they also examined the employees said to have been implicated in the breakdown. They gave their approval to all that had been done by Mr. A. Yuill, the Manager, including the superseding of the man in charge of the meter-house, and the installation of a self-recording pressure-gauge in the exhauster-house.

In the Glasgow Town Council on Thursday, Mr. Alston asked if the Convener of the Gas Committee could inform the Council as to the cause of the serious loss of gas from the No. 2 gasholder at the Provan Gas-Works, amounting to about 2 million cubic feet, on Friday, the 8th inst., and if he could state whether that holder was the same as the one found to be defective before being used, on its being completed and handed over by the Contractors. Bailie M. W. Montgomery, the Sub-Convener, replied that none of the holders had ever been defective. The cause of the loss of gas, so far as could be ascertained, was that the lute became unsealed by the water syphoning out through the steam-pipe used for keeping the water free from ice. This is quite instructive, as what happened at Provan may happen elsewhere. The danger will be noted, and means taken to prevent a recurrence of the incident. As to the insinuation that one of the two large holders at Provan was found to be defective, the statement, as Bailie Montgomery said, was not accurate. What happened was that the tank of one of the holders—No. 1—leaked after it was filled; but the Contractors put it in order before they handed it over. I was asking about this the other day, and was informed that it was perfectly tight now.

At their meeting this week, the Town Council of Arbroath had before them a statement prepared by the Gas Manager showing the extra sum charged per 1000 cubic feet for gas supplied through prepayment meters in a large number of towns in Scotland. The Gas Committee observed from this statement that there was a very great divergence in the rates charged. They found that in one or two towns the charge was lower than in Arbroath; but in a considerable number of cases the difference was much greater than in that town. On the whole, they were satisfied that the Arbroath charge was moderate and below the average, and they agreed that the present difference in price—5d. per 1000 cubic feet—should be continued. The Manager submitted to the Committee a further report, in regard to the introduction into the gas-works of machine stoking. He and the Convener had visited Alloa and Dunfermline, where very complete plants, upon different systems, have been introduced. The plant in use at Alloa had cost £1800. It was not, however, complete, and it was proposed to erect further plant for dealing with the removal and storage of coke. At Dunfermline, the plant was most complete; and the probable cost of introducing the system into the Arbroath works would be about £3000. According to the figures submitted by the Manager, there would be some saving by the introduction of machine stoking, although it would entail a large initial outlay; but the Committee were of opinion that the subject should have more consideration, and they agreed to let it lie over for the present.

A Sub-Committee of the Cleaning and Lighting Committee of the Edinburgh Town Council have agreed to recommend that a room be fitted up in the City Chambers for the testing, by the City Analyst, of the illuminating power of the gas and electricity supplied. The same Sub-Committee had under consideration a proposal to extinguish every alternate incandescent gas-lamp at midnight; but as this would necessitate a rearrangement of the lighting staff, the subject was referred to the Inspector of Lighting for a report. It is stated that the city is now within 1000 lamps of being lighted, so far as gas is concerned, solely by incandescent burners.

It will be recollected that, after much discussion, of a heated nature, upon the question of whether or not a railway siding should be made into the gas-works, the Corporation of Hamilton (themselves in favour of the scheme) agreed to take a *plébiscite* of the ratepayers, and to abide by their decision upon the subject. This was taken about the beginning of May last. It resulted most unsatisfactorily, as all appeals do, only 2360 ratepayers out of 6109 having returned their cards. The decision of those who voted was against the construction of the siding, by 1204 votes to 1154; and the scheme was dropped. It has, however, been revived by the Gas Committee. This week they submitted a minute to the Town Council, in which they stated that they had considered the question of the annual payment of £100 for wayleave and feu duty for the proposed gas-works siding, and recommended, by a majority, that the siding be proceeded with; that instructions be given for the preparation and issuing of schedules for the work; and that power be given to the Committee to carry out the work. This minute gave rise to fierce discussion. The question having been settled so recently, it was considered to be unfair to the opponents of the scheme that it should be revived so soon, and that it should be sprung upon the Council in the way it had been. On the other side, it was contended that the Council, having to pay the £100 a year, might have the benefit of the siding; and it was maintained that a railway siding would have been the means of earning a profit of £200 in the course of the current year. However, to remove the appearance of the Gas Committee having taken advantage of the Council, they agreed to the matter being recommitted for further consideration.

The electrical equipment of the town of Ayr broke down sadly this

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 458.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
500,000	10	Oct 12	10½	Alliance & Dublin 10 p.c.	21—22	..	4 15 5
245,112	10	,,	7⅞	Do. 7 p.c.	14½—15½	..	4 16 9
200,000	5	Nov. 4	7	Bombay, Ltd.	6¾—7¼	..	4 16 7
40,000	5	,,	7	Do. New, £4 paid	5—5¼	..	5 1 10
50,000	10	Aug. 30	14	Bourne-mouth Gas & Water } 10 p.c. & B 7 p.c. Pref. 6 p.c.	28—29	..	4 16 7
51,810	10	,,	7		17—17⅞	..	4 0 0
53,200	10	,,	6		15—16	..	3 15 0
380,000	Stk.	Aug. 15	12½	Brentford Consolidated	262—267	..	4 13 8
300,000	,,	,,	9¾	Do. New	200—205	..	4 12 8
50,000	,,	,,	5	Do. 5 p.c. Pref.	120—125	..	4 0 0
206,250	,,	Dec. 13	4	Do. 4 p.c. Deb.	101—104	..	3 16 11
220,000	Stk.	Sept. 27	11½	Brighton & Hove Orig.	232—237	..	4 14 11
460,320	,,	,,	8½	Do. A. Ord. Stk.	163—168	..	4 18 3
460,000	20	Sept. 27	10	British	42—43	..	4 13 0
104,000	Stk.	Aug 15	6	Bromley, Ord. 5 p.c.	121—125	..	4 16 0
165,700	,,	,,	4¾	Do. do. 3½ p.c.	91—94	..	4 15 9
500,000	10	Oct. 12	7	Buenos Ayres (New) Ltd.	11⅝—12	..	5 16 8
250,000	Stk.	Dec. 13	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
150,000	20	July 12	8½	Cagliari, Ltd.	24—26	..	6 6 11
100,000	10	Sept. 27	10	Cape Town & Dis., Ltd.	14—15	..	6 13 4
100,000	10	Oct. 26	4½	Do. 4½ p.c Pref.	8½—9½	..	4 14 9
50,000	50	Nov. 2	6	Do. 6 p.c. 1st Mort.	50—52	..	5 15 5
50,000	Stk.	Dec. 28	4½	Do. 4½ p.c. Deb. Stk.	56—98	..	4 11 10
157,150	Stk.	Aug. 15	5	Chester 5 p.c. Ord.	110—112	..	4 9 3
1,443,280	Stk.	Aug. 30	5⅛	Commercial 4 p.c Stk.	110—113	..	4 12 0
560,000	,,	,,	5	Do. 3½ p.c. do.	108—111	..	4 10 1
475,000	,,	Dec. 13	3	Do. 3 p.c. Deb. Stk.	83—85	..	3 10 7
800,000	Stk.	,,	6¾	Continental Union, Ltd.	125—128	+1	5 1 7
200,000	,,	,,	7	Do. 7 p.c. Pref.	138—143	..	4 17 11
432,070	Stk.	Aug.	5⅜	Derby Con. Stk.	122—124	..	4 8 9
55,000	,,	Jan.	4	Do. Deb. Stk.	105—107	..	3 14 9
486,090	10	Jan. 31	11	European, Ltd.	24⅜—25⅜	+⅛	4 6 3
354,060	10	,,	11	Do. £7 10s. paid	18—19	..	4 6 10
15,203,110	Stk.	Feb. 14	4,⅝	Gas-light and Coke } 4 p.c. Ord.	95½—96½*	..	4 11 4
2,600,000	,,	,,	3⅛	3½ p.c. max.	88—90*	..	3 17 9
3,799,735	,,	,,	4	4 p.c. Con. Pref.	106—108*	+½	3 14 1
4,193,975	,,	Dec. 13	3	3 p.c. Con. Deb.	84—86	..	3 9 9
258,740	Stk.	Sept. 13	5	Hastings & St. L. 3½ p.c.	98—103	..	4 17 1
82,500	,,	,,	6⅝	Do. do. 5 p.c.	118—121	..	5 7 5
70,000	10	Oct. 12	11	Hongkong & China, Ltd.	19½—20⅝	..	5 7 4
4,940,000	Stk.	Nov. 14	8	Imperial Continental	181—184	..	4 7 0
473,600	Stk.	Feb. 14	3⅝	Do. 3½ p.c. Deb. Red.	93—95*	..	3 13 8
183,242	Stk.	Aug. 30	6	Lea Bridge Ord. 5 p.c.	120—125	..	4 16 0
306,083	,,	Dec. 28	4	L'rpool Unit'd Deb. Stk.	109—111	+1	3 12 1
561,000	Stk.	Aug. 30	10	Liverpool United A	226—228	..	4 7 9
718,100	,,	,,	7	Do. B	167½—169½	..	4 3 1
144,140	Stk.	Feb. 14	7⅞	Maidstone 5 p.c.	142—147*	+¾	5 3 8
75,000	5	Nov. 29	5	Malta & Medn., Ltd.	4¼—4½	..	5 5 3
560,000	100	Oct. 1	5	Met. of 5 p.c. Deb.	101—103	..	4 17 1
250,000	100	,,	4½	Melbourne 4½ p.c. Deb.	101—103	..	4 7 5
541,920	20	Nov. 14	3¼	Monte Video, Ltd.	11⅝—12½	..	5 12 0
1,775,892	Stk.	Aug. 15	4⅝	Newc'tle & G'tesh'd Con.	110—111	..	4 3 4
406,025	Stk.	Dec. 28	3½	Do. 3½ p.c. Deb	96—97	..	3 12 2
15,000	10	Aug. 30	10	North Middlesex 10 p.c.	20—21	..	4 15 3
55,940	1	,,	7	Do. 7 p.c.	13⅜—14⅝	..	4 16 7
300,000	Stk.	Nov. 29	8	Oriental, Ltd.	150—155	..	5 3 3
60,000	5	Sept. 13	7	Ottoman, Ltd.	6—6¼	..	5 7 8
398,490	5	Oct. 26	7	Primitiva Ord.	7⅞—8¼	..	4 6 2
796,980	5	Jan. 31	5	Do. 5 p.c. Pref.	5—5¼	−⅛	4 15 3
488,900	100	Dec. 1	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
851,070	10	Oct. 12	7	River Plate Ord.	12¼—12¾	..	5 7 8
300,000	Stk.	Dec. 28	4	Do. 4 p.c. Deb.	95—97	..	4 2 6
250,000	10	Sept. 27	8	San Paulo, Ltd.	13—13¼	..	5 18 6
125,000	50	Jan. 2	5	Do. 5 p.c. Deb.	48—50	..	5 0 0
135,000	Stk.	Sept. 13	10	Sheffield A	248—250	..	4 0 0
209,984	,,	,,	10	Do. B	248—250	..	4 0 0
523,500	,,	,,	10	Do. C	248—250	..	4 0 0
70,000	10	Oct. 26	10	South African	15½—16½	..	6 1 3
6,350,000	Stk.	Feb. 14	5½	South Met., 4 p.c. Ord.	124—126*	−¼	4 7 4
1,895,445	,,	Jan. 16	3	Do. 3 p.c. Deb.	84—85	..	3 9 9
201,720	Stk	Sept. 13	8	South Shields Con. Stk.	158—160	..	5 0 0
605,000	Stk.	Aug. 15	5½	S'th Suburb'n Ord. 5 p.c.	123—126	..	4 7 4
60,000	,,	,,	5	Do. 5 p.c. Pref.	123—126	..	3 19 4
117,058	,,	Jan. 16	5	Do. 5 p.c. Deb. Stk.	125—130	..	3 16 11
502,310	Stk.	Nov. 14	5	Southampton Ord.	107—112	..	4 9 3
120,000	Stk.	Aug. 30	6½	Tottenham A 5 p.c. and B 3½ p.c.	12—130	..	5 0 0
398,940	,,	,,	5		1 14—106	..	4 14 4
137,500	,,	Dec. 28	4	Edmonton 4 p.c. Deb.	101—103	..	3 17 8
182,380	10	,,	8	Tuscan, Ltd.	10½—11	..	7 5 6
149,900	10	Jan. 2	5	Do. 5 p.c. Deb. Red.	102—104	..	4 16 2
193,742	Stk.	Sept. 13	5	Tynemouth 5 p.c. max.	106—108	..	4 12 7
30,000	Stk.	Feb. 14	8		—	..	—
255,636	,,	,,	6½	Wandsworth A 5 p.c. and C 3½ p.c.	138—143*	+1½	4 10 11
75,000	,,	,,	5⅝		111—113*	+¾	4 19 1
79,416	,,	Dec. 28	3	Putney 3 p.c. Deb. Stk	79—82	..	3 13 2
845,872	,,	Aug. 15	5⅛	West Ham 5 p.c. Ord.	104—107	..	4 15 9
185,000	,,	,,	5	Do. 5 p.c. Pref.	122—125	..	4 0 0
228,300	,,	Dec. 28	4	Do. 4 p.c. Deb. Stk.	102—105	..	3 16 2

Prices marked * are "Ex div."

week. On Thursday evening, about eleven o'clock, a water-pipe burst at the corner of High Street and Carrick Street, which had the effect of flooding a transformer chamber at the foot of Wallace Tower. The fuses gave way in consequence, and the street arc lamps failed over a considerable part of the town. The chamber was quickly freed of water yesterday morning; but it could not be dried soon enough to admit of its being utilized under normal conditions. When darkness came on last night, it was sought to get over the difficulty by putting the various parts of the town supplied through the Wallace Tower transformer on to other circuits, with the result that the extra load destroyed the fuses, and about 100 public arc lamps were unlighted. The streets throughout the town were almost destitute of light till nine o'clock. The whole district north of the river was entirely without light, neither arc nor incandescent lamps being available. On the south side of the river, those who were on the direct current had their usual supply of light; but those on the alternating circuit were without any.

An explosion of gas occurred on the evening of Saturday last in the shop situated at No. 519, St. Vincent Street, Glasgow, occupied by the St. George's Co-operative Society. Two plate glass windows, and the glass panel of a door were blown out into the street. No one was injured. The manager of the establishment was conscious of a smell of gas shortly before the explosion; and he was of opinion that the gas had escaped from a leak in a gas-stove at the back of the shop.

The Corporation of Dumfries have agreed to the holding of an exhibition of gas cooking, heating, and lighting appliances, on condition that the promoters do not canvass consumers who are already provided with gas-stoves.

The ordinary general meeting of the Coatbridge Gas Company was held on the 7th inst., when the Directors reported that the accounts for the six months ending Dec. 31 last were satisfactory. The sales of gas were still largely on the increase; the total consumption for the period covered (including about 2 million cubic feet for motive power at the special rate) amounting to 83,917,288 cubic feet, which was an augmentation of almost 5½ millions in comparison with the corresponding period of 1905. There had been increases of 243 in the number of ordinary and prepayment consumers, and of 320 in the number of cooking and heating appliances hired out, during the half year. The gross revenue was £14,028; and though the rates for gas were reduced at the commencement of the half year, there was sufficient profit to permit of the payment of dividends (as prescribed by sliding-scale) at the rate of 11½ per cent. per annum on the original stock, and 8·2 per cent. per annum on the various issues of £10 shares, less income-tax, and the addition of £200 to the reserve.

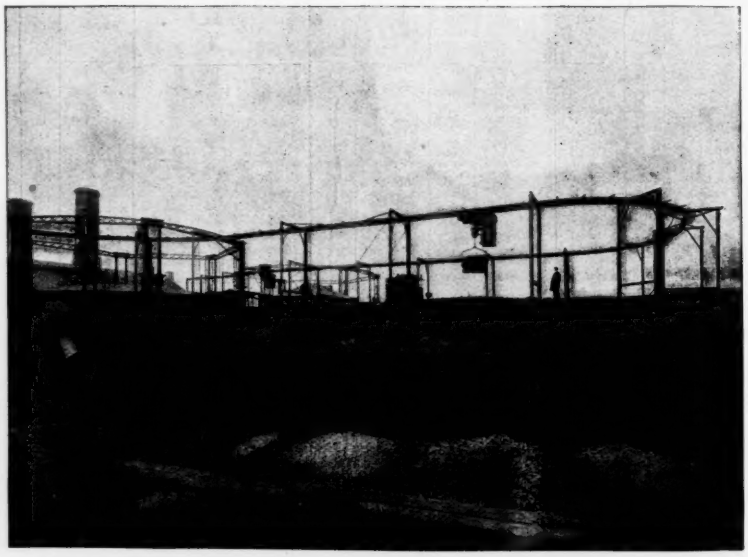
On Thursday evening, a concert, in aid of the funds of the Granton Gas-Works Sick Benefit Society, was given in the Music Hall, George Street, Edinburgh. There was an attendance of 1300 persons. The concert was held under the patronage of the Lord Provost of Edinburgh, the Provost of Leith, and of the Edinburgh and Leith Gas Commissioners. A highly appreciated programme was gone through.

On the evening of Friday, the 8th inst., the employees in the Kilmarnock Corporation Gas-Works held their annual social meeting in the Art Galleries of that town. Tea was served to about 180 persons. Ex-Bailie R. Muir, the Convener of the Gas Committee, presided. A large number of town councillors and officials, including the two Gas Managers—Messrs. W. & C. Fairweather—were present. A very happy evening was spent in song and recitation, after which dancing was engaged in till four o'clock in the morning. The Chairman, in the course of some speaking which took place, said that the gas consumption last year was greater than in any previous year; and the Committee had made up their minds that they would still further increase the consumption, by encouraging people to use gas-cookers, which they were supplying on very favourable terms. They had now 700 in use, and more were going out every week. They intended to go a step further, and to hire out gas-fires also. He might tell them that if the gas undertaking had not had to bear the burden of a deficiency in connection with the electric light, the price of gas, instead of being 2s. 8½d. per 1000 cubic feet, would have been reduced to 2s. 6d. The new gas-works were now completed, and were giving the greatest satisfaction. A pleasing feature of the undertaking was that the whole indebtedness—including both the old works and the new—was little more than the amount the Corporation paid for the old worn-out works 35 years ago. At that time the consumption of gas was only about one-sixth of what it was at present. The indebtedness on the works was about £55,000, and they were making over 170 million cubic feet of gas every year. He did not think they would find a parallel to that anywhere. He knew of places where, with almost a similar consumption, the indebtedness was as high as £180,000. He did not think the Corporation had anything to fear, so far as the gas-works were concerned. "Success to the Gas-Works" was proposed by Councillor Watson, and was responded to by Mr. W. Fairweather. He was glad to say that he had a set of good, honest, steady men, who attended faithfully to their work.

Exmouth Water Supply.—At the last meeting of the Exmouth Urban District Council, it was decided to apply to the Local Government Board for power to borrow £5763 for the improvement of the water supply. The proposed works include a reservoir and filter-beds for the supply of the high-level district, with the necessary mains, &c. The scheme has been designed by the Surveyor (Mr. S. Hutton), and has the approval of Mr. Strachan.

Supply of Free Washers for Taps at Croydon.—At a recent meeting of the Water Committee of the Croydon Town Council, it was recommended that washers should be supplied and fitted to leaky taps free of charge, at any rate for twelve months. Mr. King, who moved that the suggestion should be carried out, said the washers only cost 1d. or 2d. apiece—the amount involved being only about £12. Mr. Mabey moved, as an amendment, that the words "free of charge" be deleted, as he did not see why the work should be done for nothing. The Town Clerk said the Council could not legally impose such a charge. Mr. Stewart remarked that they were not prepared to set up a municipal plumber's shop in Croydon. The amendment was lost.

TEMPERLEY TRANSPORTERS



Temperley Transporter Plant for Storing Coke at the Paisley Corporation Gas-Works. The same plant is used for screening and loading into delivery carts.

For the

RAPID AND ECONOMICAL

HANDLING OF COAL & COKE

AT

Gas - Works, Electricity Generating Stations, &c.,

BY MEANS OF GRABS OR PATENT AUTOMATIC DUMPING BUCKETS.

Temperley Transporter Co.

72, Bishopsgate Street Within, LONDON, E.C.

Telephone: 365 LONDON WALL.
Telegrams: "TRANSUMO, LONDON."

NO BREAKAGE OF COKE if you use Temperley Transporters.

CURRENT SALES OF GAS PRODUCTS.

Week ending Feb. 16.

The London market for tar products has been very steady. There is a good inquiry for pitch; and the improvement in the value of this article is maintained. Shipments continue to be very heavy; and stocks are accordingly unusually light. Ninety per cent. toluol is worth 1s. 2d. to 1s. 2½d. net. Naphthalene is in demand; but prices will have to improve before manufacturers can be induced to produce this article. Sulphate of ammonia is without change.

LIVERPOOL, *Feb.* 16.

Sulphate of Ammonia.

There has been nothing special in the market upon which to comment. Available parcels continue to find buyers, but competition for them has become less keen, and there has been no further improvement in values. The closing quotations are consequently £11 17s. 6d. per ton f.o.b. Hull, £12 to £12 1s. 3d. per ton f.o.b. Liverpool, and £12 2s. 6d. per ton f.o.b. Leith. Home demand has been restricted, inclement weather having delayed agricultural operations. There has been no alteration in the forward position. The large makers are rather fully sold at high prices, and the smaller makers are not concerned to sell ahead unless at a substantial premium on spot values. On the other hand, buyers are hanging back for the chance of doing better.

Nitrate of Soda.

This article has assumed a firmer tone, and spot prices have been advanced to 11s. 6d. and 11s. 9d. per cwt. for 95 per cent. and refined qualities respectively.

LONDON, *Feb.* 16.

Tar Products.

Markets have been fairly well maintained during the past week. Pitch remains steady; but there does not appear to be quite so much demand as was the case a week ago, which may be owing to the fact that buyers have now covered their requirements for the time being. Business is again reported to have been done at 25s. on the east coast to June, and there is probably a fair quantity still to be sold for this delivery. On the other hand, some of the manufacturers are now quite comfortable, and will not entertain anything like such figures. On the west coast, 24s. has been accepted for delivery to the end of June; while business has been done at 23s. 9d. at Manchester, and 24s. 6d. at Liverpool. Creosote is steady. Some quantity of outside London makes could be secured at a fairly reasonable price; but the principal London makers are well sold, and do not care to quote. In the Midlands, oil is exceedingly scarce, and high prices are asked; while in the North, manufacturers are fairly well sold, and quite prepared to wait before placing any further quantity. Benzol, 90 per cent., is decidedly quiet. Some quantity was offered for sale in the Midlands at 8½d. into buyers' packages without success; while business is said to have been done at under 10½d., casks included, upon the east coast. In London, manufacturers appear disposed to sell at a reasonable figure, but there is a decided scarcity of orders for the moment; and country makes are reported to have been sold on rails London at 11d. per gallon. There is little offering in 50-90 per cent., which is steady. In toluol, makers are well sold, and will not entertain business except at good prices; while consumers do not seem anxious to buy for the time being. Solvent naphtha is decidedly firm, especially in London, and for the finer qualities very high prices are reported to have been paid for 95 per cent.; while ordinary 90 per cent., actual London make, continues to fetch good figures. In the country, prices are fairly well maintained; but there have been sellers at reasonable figures at certain ports upon the east coast. There is no change in carbolic acid, and values remain the same; both Continental and English consumers refusing to improve upon their previous offers, which makers at present will not entertain. There is not much doing in crystals; but small orders continue to be taken from time to time at current market prices.

The average values during the week were: Tar, 13s. 6d. to 17s. 6d. Pitch, London, 25s. to 25s. 6d.; east coast, 25s.; west coast, 23s. 9d. to 24s. 6d. Benzol, 90 per cent., 10½d. to 11d.; 50-90 per cent., 11d. to 11½d. Toluol, 1s. 1½d. to 1s. 2½d. Crude naphtha, 4¾d. to 5d.; solvent naphtha, 1s. 1½d. to 1s. 3½d.; heavy naphtha, 1s. 2d. to 1s. 4d. Creosote, London, 2d. to 2¼d.; North, 2d. to 2¼d. Heavy oils, 2⅛d. to 2⅜d. Carbolic acid, 60 per cent., 1s. 8½d. to 1s. 8¾d. Naphthalene, £6 to £10; salts, 35s. to 40s. Anthracene, "A" quality, 1½d. to 1⅝d.

Sulphate of Ammonia.

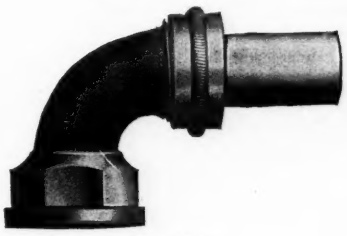
The market for this article is steady, though in London it is reported that very low prices have been accepted under tender. The principal London Gas Companies maintain their quotation of £12 5s. for February-June; but other makes could be secured at considerably under this figure. In Hull, business has been done at £12 for prompt, and £12 2s. 6d. for February-April. In Leith, £12 1s. 3d. was offered for prompt delivery without success; and the buyer finally paid £12 2s. 6d., thus establishing the value at this place. In Liverpool, business has been done at £12 and £12 2s. 6d. for good grey; but discoloured makes have been sold at considerably under these figures.

New Issues of Gas and Water Capital.—By announcements appearing in our advertisement columns, our readers have been informed that the Croydon Gas Company are about to sell by tender £25,000 of "D" 5 per cent. stock, at a minimum price of £107 per £100. Tenders are to be sent in by the morning of the 6th prox. Next Friday, Messrs. T. Martin and Sons, of Exeter, will offer for sale by auction 150 additional £10 ordinary shares and 200 preference shares (5 per cent.) of the same nominal value in the Crediton Gas Company. The ordinary shares are entitled to a dividend up to 7 per cent., subject to the sliding-scale. On Thursday, Mr. Atkinson Gibson will sell by auction additional capital stock of the Sunderland and South Shields Water Company to the nominal amount of £30,000, entitled to a minimum dividend of 5 per cent.

SAWER & PURVES

Stove Fittings.

STOVE BEND.



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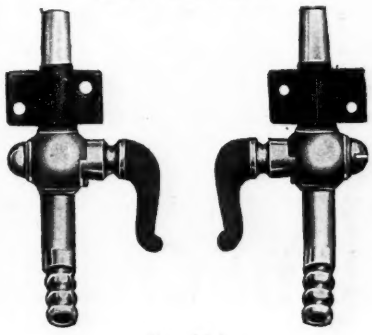
WING HOB TAPS.



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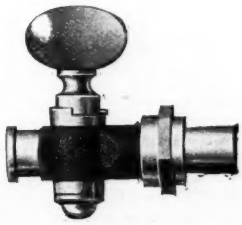
STOVE TAP.



No. 110.

SAWER & PURVES,

MANCHESTER & NOTTINGHAM.

COAL TRADE REPORTS.

Lancashire Coal Trade.

Reports from all the mining districts of the county show the most active business in all sections of the coal trade. Stocks of steam coal have long ago disappeared, and supplies can only be got direct from the pits. House coal, too, is in much the same position, and difficult in some quarters to obtain. More coal is being exported. The increase last year by the Ship Canal was no less than 222,000 tons. The demand for gas coal and cannel shows slight signs of easement. Delays in transit and lack of returns of coal-trucks by railway companies are complained of. The average quotations at the pits are as follow: Best house coal 14s. 6d. to 15s. 6d. per ton, secondary 13s. 6d. to 14s. 3d., common 10s. to 12s. 6d., burgy 8s. 10d. to 9s. 6d., best slack 8s. to 9s., medium 7s. 6d. to 8s., common 6s. 9d. to 7s. 3d., shipping 10s. 6d. to 11s. 6d., coke for furnaces 17s. to 24s. For some of the better classes of coal, higher prices than the above are charged at the pit's mouth. At four local collieries, the charges for best selected house coal are 16s. 8d. per ton, Trencherbone at four pits 15s., shuttle riddled 14s. 2d., four-feet 13s. 4d. and 14s. 2d., riddled 11s. 8d., burgy 10s. 10d. and 11s. 3d., nuts 13s. 4d., slack 9s. 7d., and washed slack 10s. 5d. At Manchester and Salford wharves, some of these prices are exceeded. Progress with new mines in the Midlands is reported. Trade in South Yorkshire coal is stated to be brisk, both for home consumption and for export.

Northern Coal Trade.

While in some quarters it is thought that the highest price has for the present been reached in the coal trade, there is still great general activity in it, with full shipments; and an exceedingly strong demand continues. The fact also that many collieries have booked orders well on into the spring makes the prospect hopeful. In the steam coal trade, best Northumbrians are now tolerably steady at 15s. per ton f.o.b., second-class steams are 13s., and steam smalls rather brisker at from 7s. 9d. to 8s. 9d. The pits seem to be working well; and this must be expected to continue. In the gas coal trade, there is now a rather less home delivery; and the milder weather should tend further in this direction. More of the foreign contracts, however, are being placed; so that the exports of that class of coal should increase. High prices are quoted—from 12s. 3d. to 13s. per ton f.o.b. being a current quotation; while in some cases, higher values are spoken of. One or two contracts—for Malmo and Kiel for instance—have been booked; but the quantities are not large. The prices agreed upon are on a somewhat similar basis to that of the Stockholm contract previously named, and show the same substantial advance on last year's figures. In the coke trade, the demand is fair, and gas coke benefits—stocks of the latter are sometimes small, and production is less. Good gas coke is quoted from 13s. 6d. to about 14s. 3d. per ton f.o.b.

Scotch Coal Trade.

The market is still rising. There is a great demand for coal, for consumption both at home and abroad. Outputs are being easily disposed of. Shipping to the Baltic and other northern ports is about to be resumed for the season, in anticipation of which further advances are looked for. The prices quoted are: Ell 12s. to 13s. 6d. per ton f.o.b. Glasgow, splint 12s. to 12s. 6d., and steam 11s. 3d. to 11s. 6d. The shipments for the week amounted to 268,526 tons—an increase of 9269 tons upon the previous week, and of 15,938 tons upon the same week of last year. For the year to date, the total shipments have been 1,325,507 tons—an increase of 43,096 tons upon the corresponding period of 1906.

The Proposed Gas-Coal Combination.

Reverting on Thursday to their previous remarks on the subject of a gas-coal combination (which were noticed on p. 424 of last week's "JOURNAL"), the "Sheffield Daily Telegraph" say: "An arrangement has been entered into between colliery owners in Yorkshire, Lancashire, Derbyshire, and Notts with a view to so lifting contract prices for gas coal that a portion of the large profits now being earned by gas companies in all parts of the country shall be transferred to the colliery owners' pockets. We may add that the separate districts mentioned have all previously had their own organizations, and these will remain; but as competition between the various producing centres has hitherto been of an almost ruinous character, the present arrangement embraces, as its chief feature, the formation of a central body consisting of delegates from the District Associations who shall jointly fix the minimum prices for each area. What is more, the spirit of combination is being entered into with great earnestness. When we first mentioned the matter some four or five weeks ago, it was thought that if by the means now to be employed an additional 2s. 6d. per ton for gas fuel could be obtained, the new Association would fully justify its existence. It now seems evident that producers will not be satisfied with any such increase; and the view is taken that 4s. to 5s. per ton advance is more likely to be the result. A good deal, of course, will depend on the state of the coal trade on the North-east coast, and the demand for gas coal from the Continent. Until last year, the large London Gas Companies obtained practically the whole of their supplies from Durham; but the high rates ruling there last May diverted much of the business to our own district, and a small consignment was even received from the Continent. That the Durham people desire to run with the hare and hunt with the hounds, as it were, is to be inferred from the communication made to the Press by Mr. Reginald Guthrie, Secretary of the Durham Coal-Owners' Association." [This letter will be found on another page.—ED. J.G.L.]

Sales of Shares.—At a recent auction sale, fourteen new ordinary (1884 issue) 7 per cent. fully-paid £12 10s. shares in the Salisbury Gas Company realized, *ex div.*, from £18 17s. 6d. to £19 each. Messrs. King and King recently offered for sale 2000 additional £5 shares (5 per cent.) in the Portsmouth Water Company. They were put up in 400 lots, and the majority fetched £6 5s. each, though a few realized £6 7s. 6d. The sale produced about £12,600.

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BELL BARN ROAD, BIRMINGHAM.

West Ham Corporation and the Sulphur Restrictions Bill.

At the meeting of the West Ham Corporation last Tuesday, the Legal and General Committee reported that they had received a communication from the Borough Solicitors on the subject of the Gas Companies (Removal of Sulphur Restrictions) Bill. Mr. W. C. Young, the Council's Gas Examiner, had been consulted by the Committee in regard to the proposals of the Bill, so far as they affected the borough in connection with the West Ham Gas Company, and he stated that, having regard to the fact that all the Metropolitan Gas Companies (two of which supply gas in the borough), and many of the Suburban and Provincial Companies, had been relieved of these restrictions, and that the Departmental Committee appointed by the Board of Trade reported strongly in favour of their removal; and, further, that no complaint had been made by consumers of the extra sulphur in the gas in places where the restrictions had been abolished or had never been in force, he did not think any effective opposition could be presented to the Bill by the Council. He therefore advised the Council not to oppose. It was accordingly resolved that no petition should be presented with regard to the Bill.

Gas Profits at Walsall.

The report of the Walsall Gas Committee, dealing with the working for the twelve months to Dec. 31, which has been adopted by the Town Council, showed a net profit of £8658, out of which it was proposed to contribute £6000 in reduction of the borough rate. Mr. Turner, who presented the report to the Council, said that the profit earned had only been exceeded on two previous occasions; the largest figure having been £9911 in 1894. The total amount of gas made was 480,186,000 cubic feet, or an increase of 14,813,000 feet. The coal carbonized was 45,600 tons, against 45,918 tons the previous year; but the yield of gas per ton was 10,533 cubic feet, as compared with 10,124 feet. There had been a reduction of £1059 in the cost of coal, and of £440 in purifying. The reduction in the price of gas for power purposes had been justified by an increase of 11 per cent. in the demand. In spite of keen competition, the gas undertaking remained the premier concern for power and lighting purposes. The Committee expected that this year their profits would be affected by the necessity for paying more for coal. Mr. Venables remarked that the advance in coal prices would probably represent a loss to the Committee of from £2000 to £3000. Alderman Hughes pointed out that the Committee made their profit by keeping up the charges; and Mr. Halford urged that the price of gas for manufacturing purposes should be still further reduced.

Large Ratepayers who Cannot Vote.

Meetings of three of the most important Railway Companies in the country—the London and North-Western, the Great Western, and the Great Northern—were held on Friday; and at each of them reference was made to the subject of increased rates. At the meeting of the first-named Company, the Chairman (Lord Stalbridge) said that, in London in particular, the rates had gone up by leaps and bounds; but they had now a great opportunity of looking after, not only their own, but also the general interests of ratepayers. The Company's rates and taxes had increased in the last ten years from £368,424 to £603,530, or by £235,106, and they were now equal to £1 8s. per cent. per annum of the dividend on the ordinary stock. Perhaps the best way of showing the proprietors the seriousness of the matter was by supposing that the rates and taxes were deducted from their dividend in the same way as the income-tax. At present 1s. in the pound was taken off for income-tax; but the rates and taxes would amount to 4s. 5d. in the pound. At the Great Western meeting, Mr. Alfred Baldwin, M.P., who presided, referred to the same subject, and pointed out that the rates and taxes were higher in the past half year by £11,598, of which about £7000 was due to poundages. At the Great Northern meeting, while Lord Allerton was able to congratulate the shareholders on a reduction of £4000 in the sum paid for rates and taxes, he was careful to point out that this was the result of the victory the Company had won in the matter of assessments, as the poundage was still constantly increasing.

New Joint-Stock Companies.—The English Gas-Mantle, Limited, has been registered with a capital of £50,000, in £1 shares, to adopt an agreement with the Dura Incandescent Mantle Company, Limited, and F. S. Salaman, and to carry on the business of manufacturers and importers of, and dealers in, incandescent gas-mantles. Under the title of Ecliptic Gas Light, a Company has been registered, with a capital of £10,000 in £1 shares (2100 "A" and 7900 "B"), to take over the business of manufacturing globes and fittings in connection with gas lighting, and of buying and selling gas-meters, carried on by Mr. George Helps at premises in Bond Gate, Nuneaton, together with the rights secured by the vendor in certain inventions. There will be no initial public issue.

Public Lighting at Devonport.—Reference was made at the meeting of the Devonport Town Council on Thursday to the question of the improved lighting of the principal streets. The Joint Lighting Sub-Committee reported that they had considered the reports of the Gas Engineer and the Electrical Engineer as to the lighting of streets where the electric cables are now laid, and recommended that such streets (other than Fore Street) be lighted with incandescent gas, as advised by the Gas Engineer. Sixty-four incandescent lamps of 420-candle power (three burners) are to be used, at a cost of £6 4s. 8d. per lamp; being a total annual cost of £399. When the subject was reached at a late hour, it was intimated that there would be a good deal to be said about it; and it was suggested that the standing orders putting a time limit to members' speeches should be suspended. The Mayor said he thought it would be better to devote a special meeting to the subject; and it was agreed that this should be done—the Mayor promising to call the meeting at an early date.

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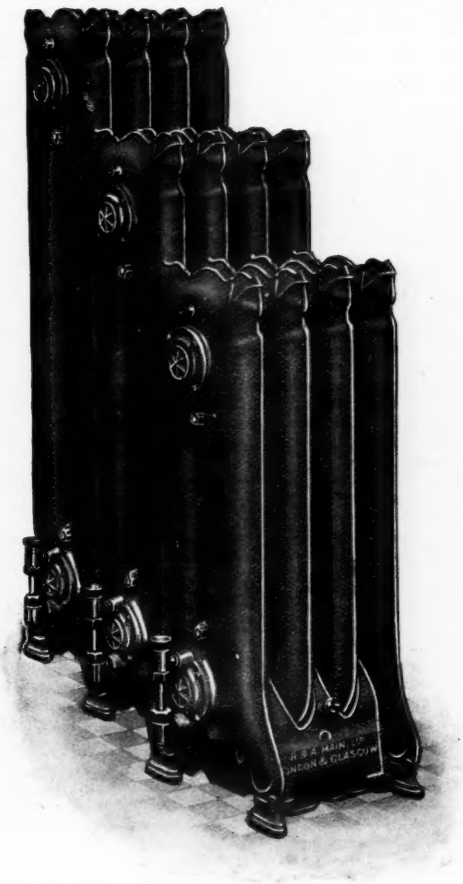

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Extension of the Cheltenham Water-Works.—The Cheltenham Town Council, who, in addition to their own borough area, supply the town of Tewkesbury with water, have decided to spend an estimated sum of £4000 on new pumps at the Tewkesbury works, and an additional £1000 on necessary alterations to the buildings, foundations to engines, well work, &c.

Ryde Water Supply.—At a cost of £1300 the Water Committee of the Ryde Town Council have laid water-mains to increase the pressure in the St. Helen's district, the demands for water in which have now increased from 1,594,000 to 17,629,000 gallons. It has been explained that but for supplying other districts Ryde would be paying a water-rate, which they have not done for four or five years.

Chard Water Supply.—After more or less consideration of the subject for about eight years, the Water Committee of the Chard Corporation have come to the conclusion that the proposal to obtain a supply of water by gravitation from the neighbouring parish of Buckland St. Mary is not feasible. At a meeting of the Town Council last Wednesday, it was decided to rescind a resolution passed in 1899 instructing the Committee to carry out a gravitation scheme. An estimate will now be prepared of the cost of providing water by pumping.

The Bland Light.—Messrs. Bland and Co. are to supply the Gaslight and Coke Company with their No. 11 inverted burner for the purpose of lighting the forthcoming Furnishing Exhibition at Earl's Court. Messrs. Bland have received from one of the churchwardens of St. Margaret Pattens, Rood Lane, London (in which church their light was recently installed), a letter stating that the installation has been a great success, and everyone is pleased with it. The writer considers the system an ideal one for church lighting, and anticipates a great saving of gas—the number of burners being less than half what it was formerly.

Municipal Electricity at Woolwich.—The Finance Committee of the Woolwich Borough Council were unable to present the new estimates at the meeting last Thursday, owing to financial difficulties; and a temporary overdraft of £55,000 had to be sanctioned to meet present liabilities. Mr. Widger said the new rate would be an increase of 1s. in the pound; and 10d. of this he attributed to loss on the electrical undertaking, which the Labour party ceased to control last November. The deplorable results of the arrangements made by the Progressive-Socialist majority respecting the electricity supply were shown in the report presented by the Electricity Committee. Mr. T. Ingram, the Chairman of the Finance Committee, said of the £60,000 overdrawn at the bank, £42,000 related to the electricity account. The Council decided to close the wiring department from the 31st prox., and to sell the stores they have in hand. It was stated that the loss on the electricity undertaking would be responsible for a rate of 5d. in the pound.

The Demand for Coke.—At the meeting of the Devonport Town Council on Thursday last, Alderman Littleton said his attention had been called to the fact that a number of small dealers in coke could not get supplies from the gas-works. These dealers hawked coke in the poorest neighbourhoods; and the fact that they could not obtain supplies caused great inconvenience. He did not know whether it was because the Gas Committee had made large contracts; but he thought the small dealers should have a chance. Mr. J. W. Buckley, the Gas Manager, said it was a fact that the Committee entered into certain contracts with reference to coke in the early part of the year. Owing to the use of oil, the quantity of coke available had decreased; and they had of late found it practically impossible to meet all demands. Alderman Littleton thought that if possible some reserve should be kept for the supply of poor people through the small dealers. Mr. Buckley said they had not absolutely cut these small dealers off; and they would do their best to meet their requirements.

Water Supply of South Molton.—The question of improving the water supply of the town was under consideration at a meeting of the South Molton Town Council last Tuesday. A report prepared by Mr. J. Siddalls, Borough Surveyor of Tiverton, stated that the supply was ample and the storage reservoir of sufficient capacity. The trunk main and service-pipes were, however, very much corroded, and ought to be entirely relaid. He also recommended the covering of the service reservoir and the construction of new filters. The present filters were inadequate and defective in construction, with the result that the water was less pure after filtration than before. He estimated at £3200 the cost of the improvements recommended. The Mayor (Mr. J. Sanders) pointed out that this expenditure would only involve an annual charge of £180, and that in a few years they would have £300 per annum from the gas-works. Considerable opposition was, however, shown to the scheme, on the ground that it meant an immediate addition of 5d. in the pound to the rates. It was eventually decided that the report should be considered in committee, with a view to devising means for carrying out the scheme in sections.

Metropolitan Water Board.—At the meeting of the Board on Friday, the Chairman of the Law and Parliamentary Committee (Mr. J. B. P. Karslake) stated that 50 petitions had been presented against the Board's Charges Bill and 54 against their Various Powers Bill. He thought a great deal of the opposition might be settled by negotiation, as a considerable amount of it arose from misunderstanding and from issues which neither of the Bills dealt with. The Works and Stores Committee reported that a letter had been received from the London County Council in regard to an unsatisfactory supply of water on the occasion of a fire which took place on the 5th ult. in Patriot Square, Cambridge Road, E. The inadequate supply of water obtainable from the hydrants in Patriot Square and Peel Grove appeared to be chiefly due to the small size of the mains, which were only 3 inches in diameter. The Committee stated that they had had under consideration a report on the subject by the Chief Engineer (Mr. W. B. Bryan, M.Inst.C.E.), which pointed out that the hydrants were all fixed at the request and to the instructions of the London County Council or their predecessors. No complaint of short supply or low pressure had been received from any of the Board's consumers; and the Chief Engineer stated that the mains in the district in question were amply sufficient for the Board's purposes. The Committee had accordingly given instructions for the substance of the report to be communicated to the Council.

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Price of Gas at Sleaford.—In the report presented by the Directors at the annual general meeting of the Sleaford Gas Company, Limited, last Tuesday, the intention was announced to reduce the price of gas to all consumers by 2d. per 1000 cubic feet as from March 31; making it 2s. 4d. and 2s. 6d. for power, and 3s. for other purposes.

London County Council and the Mitcham and Wimbledon Gas Bill.—At the meeting of the London County Council last Tuesday, the Chairman of the Parliamentary Committee (Mr. W. B. Yates), in reply to a question, stated that the Council were desirous of having clauses inserted in the above-named Bill, and therefore he moved that the necessary petition be sealed and presented against it, and the costs and expenses charged to the county fund. This was agreed to.

Carburetted Water-Gas Plant for Ashford.—The Ashford Urban District Council decided at their last meeting to adopt the recommendation of the Gas Engineer and Manager (Mr. H. R. Turner) to instal a carburetted water-gas plant at their works this year, in order to meet the increased output on the district, and the proposed extension of main to Willesborough. The Local Government Board, owing to the present state of the law, were unable to sanction a loan for this purpose; and it has therefore been decided to spread the cost of the work over three half-yearly estimates.

Biggleswade Water Supply.—It was mentioned in the "JOURNAL" some months ago that a scheme of water supply was about to be carried out for Biggleswade. It has lately been completed; and the event was celebrated by a dinner in the Town Hall. The source is a deep well sunk into the lower greensand formation. Some 70 miles of mains have been laid, and the water has been turned on at the farthest point of distribution—viz., the urban district of Kempston, which is 16 miles from the source. Mr. G. F. Deacon, M.Inst.C.E., was the Engineer. The estimated expenditure was upwards of £80,000; but we understand the scheme was carried out for £10,000 less.

Frost and Water-Pipes.—Figures placed before the Liverpool Water Committee show what an effect severe frost has on the undertaking. For the week ending Feb. 2, the total quantity of water supplied from Rivington, from Vrynwy, and from wells was 227½ million gallons, or 36·37 gallons per head of the estimated population; while for the week ended Feb. 9, the quantity supplied was 36·44 gallons per head. In the corresponding weeks last year, the figures were 183 and 179 million gallons, or 29·54 and 28·92 gallons per head respectively. The increased consumption, it is pointed out, is due to the bursting of pipes—5781 bursts having occurred between Jan. 26 to Feb. 9.

Dartmouth Water Supply.—A report was presented to the Dartmouth Town Council yesterday week, in which Mr. C. E. Newton, of Manchester, described various proposals for increasing the water supply of the town. The idea was to obtain the water from the Old Mill Valley, which comprises a gathering ground of 950 acres, and is estimated to yield a minimum supply of 128,000 gallons per day. Mr. Newton calculated that about 70,000 gallons per day is required in addition to the present supply. Several alternative suggestions were made as to the manner in which the water could be pumped from the valley and stored and distributed. The estimated cost of these schemes varied; but taking the outlay on permanent works at £4500, and on the plant at £1600, the annual amount required for interest and sinking fund would be £350. In addition to this, there would be the cost of the land, and also £175 per annum for pumping. The Surveyor (Mr. T. W. Joyce) presented a report which he had prepared after reading that of Mr. Newton, and suggested a scheme estimated to cost £4880. It was decided that the Council should meet in committee to consider the various schemes, including one prepared by the late Surveyor.

APPLICATIONS FOR LETTERS PATENT.

2709.—LEATHER, J. H., "Pipe-union joint." Feb. 4.
2713.—BULL, J. W., "Gas-cooking." Feb. 4.
2736.—PARKER, E. J., "Burners." Feb. 4.
2737.—PENDREY, J. E., "Incandescent mantle for heating purposes." Feb. 4.
2749.—GOODING, J. H. D., "Gas-burners." Feb. 4.
2776.—WILTON, T., "Approximately ascertaining the quantities of fluids passing through a pipe." Feb. 4.
2791.—JOHNSON, C. J., "Gas-regulators." Feb. 4.
2821.—RIVETT, F., and OLDHAM, S., "Burners." Feb. 5.
2828.—SMITH, A. H., and SHAW, F. G., "Gas plant." Feb. 5.
2859.—EDGE, F. R., "Gas-pendants," Feb. 5.
2919.—PRICE, H. A., and TURNER, H. C., "Cooker-grids." Feb. 6.
2920.—COWPER-COLES, S. O., "Extraction of sulphur from sulphur compounds." Feb. 6.
2935.—SHAW, J. A., "Coal and gas range. Feb. 6.
2938.—DENCH, L. T., "Attaching gas-pipes, &c." Feb. 6.
2981.—WOODALL, H. W., and DUCKHAM, A. M'D., "Discharging inclined or vertical retorts." Feb. 6.
2994.—KARYSCHEFF, A. A. DE, "Refractory materials." Feb. 6.
3016.—BREARLEY, J. H., "Ascertaining the units of heat in air heated by contact with gas-fire stoves." Feb. 7.
3023.—WOLFSON, S., "Burners and mantles." Feb. 7.
3047.—HEBRON, A. F., "Gas-stoves." Feb. 7.
3098.—WILTON, G., "Coke-ovens." Feb. 7.
3101.—AKT.-GES. FÜR SELAS-BELEUCHTUNG, "Inverted lamps." Feb. 7.
3133.—WRIGHT, J. W. B., and DARWIN, H., "Gas-cookers." Feb. 8.
3138.—ROWAN, F. J., and R. & J. DEMPSTER, LTD., "Utilization of the waste heat of the gases obtained from producers and the like." Feb. 8.
3140.—THORP, T., "Rotary gas-meters." Feb. 8.
3204.—WEST, J., "Furnaces and gas-producers." Feb. 8.
3235.—KELVEY, H. E., "Distance gas-lighter." Feb. 9.
3243.—BRUCE, A., "Air-gas plant." Feb. 9.
3270.—JONES, A. O., "Coke-ovens." Feb. 9.
3303.—AKT.-GES. FÜR SELAS-BELEUCHTUNG, "Mixture of gas and air." Feb. 9.

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We understand that Mr. W. T. Sloper has resigned his position with the Davis Gas-Stove Company, Limited, whom he has represented for nine years.

When submitting, at the 31st annual dinner of the Newport (Mon.) Gas-Works Benefit Society, the toast of "The Chairman and Directors of the Company," Mr. J. H. Canning remarked that during the last ten years most of the principal undertakings had revolutionized the process of gas manufacture, lighting, and supply. Incandescent gas-light had superseded the old system; and for a penny as much light could be secured now as could be obtained for 10d. some years ago. Alderman T. Canning, J.P., who presided, said the Chairman and Directors had sent a kind message. "The Mayor and Corporation of Newport" was proposed by Mr. T. Hazell, who pointed out how inimical high rates were to industrial progress. The Society now possess a reserve fund amounting to £247.

A draughtsman in the employ of the Great Western Railway Company was killed at Swindon by an explosion while engaged in the installation of an acetylene gas plant connected with a rifle range.

The Hawick Gaslight Company have placed an order with Messrs. Robert Dempster and Sons, Limited, of Elland, for a complete new retort-bench, consisting of five through arches, with the firm's patent shallow regenerator, complete with foundations, retort-mountings, retort-house governor, &c. The work has to be completed to the satisfaction of Mr. W. A. Smith, the Gas Company's Engineer.

A Brixton hotel was last week the scene of a suicide by means of gas; the victim being a gentleman named Forman, who had for many years represented several important members of Lloyd's. After sleeping at the hotel, he failed to answer when called; and on the door being forced, he was found dead in bed, with a rubber tube from the gas-bracket in his mouth, and a towel wound round his neck.

WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Situations Vacant.

ENGINEER. Marple Gas Department. Applications by Feb. 23.
MANAGER. Llandudno Gas Department. Applications by Feb. 28.
TRAVELLER (MANTLES). Laddite Incandescent Mantle Company.
GENERAL FOREMAN. No. 4720. Applications by Feb. 26.
WORKS FOREMAN. No. 4715.
WORKING FOREMAN. Arundel Gas Company. Applications by March 4.
CARBONIZING FOREMEN. No. 4725.
CHARGE OF SHOW-ROOM. No. 4724.
MAIN AND SERVICE LAYER. Horsham Gas Company.
FITTER. Dorking Gas Company.

Situations Wanted.

FOREMAN OR MANAGER. No. 4723.
GAS-STOVE REPRESENTATIVE. No. 4722.

Agency Wanted (Coal). No. 4717.

Plant, &c., For Sale.

ELEVATOR, &c. Blakeborough and Sons, Brighouse.
ENGINE AND EXHAUSTER. Mansfield Gas Department.
PIPES AND TANKS. No. 4721.

Stocks and Shares.

BISHOP'S STORTFORD GAS COMPANY. Feb. 26.
CHERTSEY GAS COMPANY. March 12.
CROYDON GAS COMPANY. March 6.
HAMPTON COURT GAS COMPANY. March 12.
LEA BRIDGE GAS COMPANY. March 12.
SOUTHEND GAS COMPANY. March 12.
SUNDERLAND AND SOUTH SHIELDS WATER COMPANY. Feb. 21.
TAR (PATENTS) SOLIDIFYING AND DISTILLING COMPANY.
UXBRIDGE GAS COMPANY. March 12.

Company Meeting.

CRAYS GAS COMPANY. Library, St. Mary Cray. Feb. 27. 6.30 o'clock.

TENDERS FOR

Chimney Stack.

BRECON GAS COMPANY. Tenders by March 6.

Condensers, &c.

BRECON GAS COMPANY. Tenders by March 6.

Fire-Clay Goods.

BRECON GAS COMPANY. Tenders by March 6.
CLACTON GAS DEPARTMENT. Tenders by March 6.
DUNEDIN (N.Z.) CORPORATION. Tenders by June 19.

Gasholder.

DUNEDIN (N.Z.) CORPORATION. Tenders by June 19.

Iron and Steel Work (Wrought and Cast), &c.

DUNEDIN (N.Z.) CORPORATION. Tenders by June 19.

Oil for Gas Making.

CARLISLE GAS DEPARTMENT. Tenders by March 4.

Oxide of Iron.

CARLISLE GAS DEPARTMENT. Tenders by March 4.

Purifiers and Shed, &c.

BRECON GAS COMPANY. Tenders by March 6.

Retort-Bench, &c.

BRECON GAS COMPANY. Tenders by March 6.
CLACTON GAS DEPARTMENT. Tenders by March 6.

Tar and Liquor.

CARLISLE GAS DEPARTMENT. Tenders by March 4.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

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